

Bob Cooper's

NOVEMBER 15 2004

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific and Asia

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**Meter in hand
is worth two
in the bush**

**UNdoing
UNwired
interference**

**Fiji (again).
C-band to a
wider area?**

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- ✓ Latest Hardware News
- ✓ Update: BlueKiss dies
- ✓ Observer Reports

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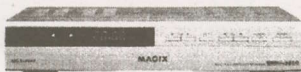
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For all prices, product information and banking details please visit the website or phone us.

Specials this month

Magix 9800 - Digital Receiver



- New Generation DiSEqC 1.3 Universal LNB using DiSEqC
 - Smart Code System (Soft Patch)
 - User Friendly
- Price: \$190 AUD + GST

Satlook - Signal Meter



- Digital, Analogue and combined versions available
 - A must for the professional
 - Simple menus and functions
- Price: Phone up for Quote

DreamMAX - DT470



- Irdeto embedded
 - 4900 Channel Memory
 - DiSEqC 1.2
 - User Friendly
- Price: \$200 AUD + GST

Everything? Yeah we got

LNB

- Zinwell C Band
- Zinwell KU Band
- MTI C Band, Superhigh gain
- One Cable Solution - CBand
- Dual Output KU 11300 MHz

Positioners

- Superjack EZ-2000
- Superjack DP-6600, DiSEqC 1.0/1.2
- Technosat DP-200, DiSEqC 1.2
- Manual Actuator Driver - EW101
- SAP 2000: 99 Memory positioner

Actuators

- Superjack HARL-3618, 18" Actuator
- Superjack HARL-3624, 24" Actuator
- Superjack DG-120, H/H Mount

Receivers

- SuperNET CA, Irdeto Embedded
- Success, Free-to-Air
- Dion DT-370, Free-to-Air Receiver
- Dion 2x CI, Hardware AllCAMed
- ChangHong, Mediaguard embedded
- SuperNET Terrestrial, DVB-T
- Phoenix High Definition STB

Dish and mounts

- 1.2, 1.8m Solid Prime focus
- 45, 60, 65, 85cm KU dish Offset
- 2.13m, 2.27m, 2.4m, 3.0m, 3.07m, 3.7m, Mesh Dish, Light and Heavy Duty PSI and JOYSAT Available

- CBand Wall brackets
- CBand Concrete mounts and stands
- KU Gutter mounts
- KU Wall mounts
- KU Float mounts
- KU Tinroof mount

Dion 818 CI - Digital Satellite Receiver



- Slim Size and User Friendly OSD
- 2x CI (Common Interface) slots
- Hardware AllCAMed

SuperJack H-H Actuator, DiSEqC embedded



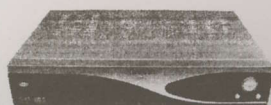
- All it takes is one coaxial cable....
- NO MOTOR CABLE REQUIRED
- DiSEqC Positioner EMBEDDED!

Supernet - Terrestrial DVB-T



- Digital Terrestrial Receiver
- Slim Design
- High Quality Picture
- Easy to install and use

Magix 9200A - Digital Satellite Receiver



- FTA + Software Patched
- FAST BLINDSCAN TECHNOLOGY
- DiSEqC 1.0/1.2 Compatible

Switches and Splitters

- 2 and 4 way DiSEqC switches
- 0/22kHz switches
- 2 and 4 way cable splitters
- V/H Multiswitch
- 0/12V Switch

Cable - 15m, 25m, 305m packs

- RG6-U Dual Shield Coaxial Cable
- RG6-U Quad Shield Coaxial Cable
- Cat5 Actuator Cable

Plugs

- F Connectors, Screw or Clamp types
- Cable joiners
- AV Splitters
- Cable Strippers
- Cable clampers
- Various other joiners and accessories e.g. RCA/SCART cables and converters

Misc

- 2.4GHz AV Sender
- Irdeto 2.06B CAMs
- Satlook Digital Signal Meter
- Satlook Analogue Signal Meter
- Satlook Digital + Analogue combo
- Satellite finders
- Angle level measure instrument
- High Quality Compasses



SatFACTS MONTHLY

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This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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our ELEVENTH year!

COOP'S COMMENT

Feeds. They come in two basic forms - those that "stand alone" and bolt/attach onto the LNB, and, those that are an integral part of the LNB. The "f" stands for "feed-attached." The first feeds were miniature horns, flared, with a wider mouth in front than at the rear. And they attached with bolts to the LNA/LNB. An English C-band TVRO designer, Steve Birkill, was the innovator to design a feed which added "dBs" to the basic horn and his work was instrumental in all feeds that followed. Feed design has been the subject of long court patent infringement suits (for example - Chaparral vs. National ADL) and judicial awards have exceeded millions awarded against the loser (which, in our example, was Chaparral). This is all very strange because a feed is nothing more (nor less) than a chunk of metal shaped in a proprietary manner to allow the LNB to interface with the reflective metallic surface of the dish. Yes - there are some advanced laws of physics involved, and no, the average guy fashioning metal in his home workshop is very unlikely to ever catch as many dB of reflected signal as the trained antenna engineer working from text books authored by Henry Jasik or John D. Kraus.

Feeds in quantity are very inexpensive - A\$5, down to A\$1. But feeds made in small quantities remain expensive - in excess of US\$1,200 for units used only by (for example) Intelsat and its unique satellite designs. The question of feed pricing is relevant to today's discussion because someone, someplace, neglected to understand that something that costs A\$1 for Ku-band DTH could in fact cost A\$200 - or more - for C-band DTH. C-band DTH? That is the still being discussed proposal submitted by satellite operator New Skies to would-be DTH operator Fiji TV which can be summarised as follows:

"If Fiji TV wants to be a DTH operator, because of satellite transponder shortages, the best choice would be I701 using a C-band spot beam creating 38.5 dBw over the Fiji Islands."

For Fiji TV the initial focus was on a footprint level which translates to dish size. The original NSS-5 Ku footprint worked with sub-90cm size dishes. The proposed spot-beam C-band boresight translates to a 120cm antenna. An inconsequential "30cm increase in dish size?" Unfortunately for Fiji TV, a 120cm prime focus C-band dish in the maximum quantity would cost them more than twice as much as a (offset design) 90cm Ku. That alone could be a reason for Fiji TV to tell NSS, "No thank you."

But there is more - that innocuous feed. C-band from Intelsat is not linear polarised (that is, "vertical" or "horizontal"); it is circular. True, there are some North American DTH Ku-band circular services but they use millions where as C-band circular are sold in the thousands per year. And Fiji-TV must somehow locate a source for low-cost C-band circular feeds or the cost per receive terminal simply goes out of sight (it is illogical to expect Fiji-TV to pay more for their customer feeds than they pay for the STB). Details? See p. 14, here.

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Fiji: OK - so NOW it COULD BE C-band! -p. 14

Undoing UNwired's terrestrial interference (Garry Cratt) -p. 18

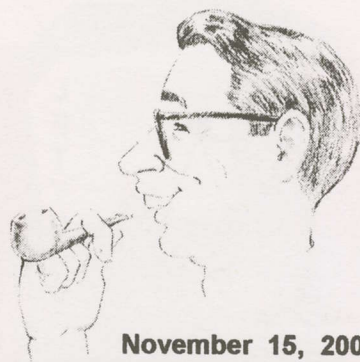
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Departments

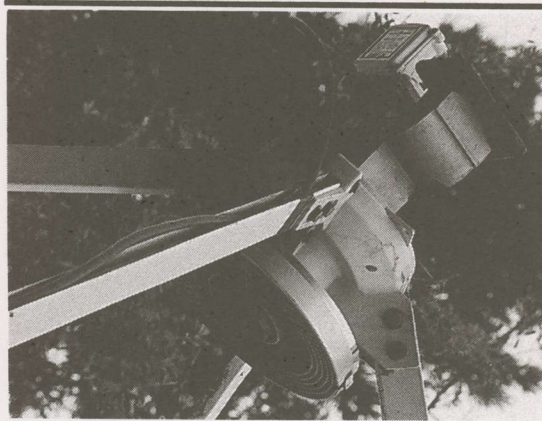
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-On the cover-

Metering. What does it have to do with earning a living in TVRO/DTH? The answers (and there are many) could be your wake-up call! - p. 6



November 15, 2004



PROGRAMMER
PROGRAMMING
PROMOTION

UPDATE

NOVEMBER 15, 2004

Tongan "cable"

"September SF's report on the forthcoming launch of small dish satellite reception to include Tonga was great news. This will introduce new competition to our local cable company which currently offers 5 channels for \$50 a month. If the people of Tonga can afford to buy a \$400 decoder box, I believe they can surely afford the Fiji Sky Pacific service - cable, by the way, charges an extra \$10 per game for each Rugby game (such as NPC) subscribers optionally elect to watch."

Kaho Ofa, Kingdom of Tonga

Tonga's "cable" system is actually another (like Samoa) user of OTA (over the air) technology. Their "decoder" boxes are Zinwell individually addressable model DVB ZDT-710. Tonga's population, more or less 100,000, represents around 18,000 potential homes for Sky Pacific.

Tonga's 5 channel terrestrial OTA provides Ch1/BBC, Ch 2/ G to PG movies + cartoons, Ch 3/ Movies + one-off sporting events such as NPC Rugby, Ch 4/ Movies, Ch 5/ ABC A-P. Being east of the "dateline" and depending upon ABC A-P through PAS-2, and lacking adequate ABC A-P PAS-8 service, they will have to hump on this one when early in 2005 Australia shuts down the PAS-2 service. Unless, of course, they get it through Fiji TV's new DTH package (which of course might explain why ABC is shutting down on PAS-2 with Fiji coming on line)!

Naked as ...

"BlueKiss (As3S) now carries the North American origin 'Naked News'. If the viewer is hard of hearing, it is possibly more entertaining than teletext. We can all be pleased that CBS's Dan Rather is not part of this 'evolution' in newscasting. I can hardly wait for the 'Naked Cooking Show'!"

paulburton@xtra.co.nz

A naked cooking show could bring an entire new meaning to the phrase 'dangling participle'. How about 'Naked NPC' or the 'Naked Cartoon Channel'? Would TVSN see a bump (or perhaps 'hump') in sales if their presenters appeared naked? Come on readers - put your mind to it and tell us which shows make more sense 'naked'. Oh yes, Paul Burton has a shameless interest in all of this - representing BlueKiss in NZ.

Naked news?? (see letter, lower left) How about naked poker? No, not "strip" poker. A lady dealer standing in front of the "Casino table", nude, dealing you your hand? Well, get ready.

The "Casino Channel" which shares the transponder with

BlueKiss on As3S (SF#122, p. 27) went off the air in October to come back as a "nude channel." Will this be a "free to VIEW" channel? You pays your money and you takes your chances!

BlueKiss NSS-6 to Australia - gone. Blaming harassment of card distributors inside Australia, by ABA, adult channel BlueKiss has terminated NSS-6 Ku operations - permanently. The As3S service (see SF#122, p. 27) continues to be available and NSS-6 subscribers in Australia have been advised to switch to this (3669V, Sr 13.333, 3/4) where, BlueKiss reports, "NSS-6 cards will work."

Major Australia C1 changes: ABC, SBS & Central 7. From 1 November to 31 January SBS SA TV now 12.720 will dual feed 12.527 (Sr 30.000, 3/4); Seven Central 7 and SBS Qld TV dual to 12.407, Sr 30.000, 2/3. Same time period: ABC SE, ABC SA, ABC Qld now 12.720 will dual feed to 12.324 with new symbol rate of 24.450, FEC 1/2 (note that!) while ABC NT, now 12.527, dual fed to 12.324 (24.450, 1/2). For Aurora service users, SBS SA moves from Aurora channel 37 to 27; Seven Central from 40 to 7; SBS Q from 41 to 9. *Additionally*, ABC NT now Aurora 29 becomes Aurora 42 (dual fed on both channels) for an additional period 1 February to 15 February. From 1 Nov to 31 Jan, service names will not appear on re-tuned professional (as opposed to home) decoders. From 1 February, all "old" (original) feeds (12.720, 12.527) will be turned off - forever. Of note: 12.407 on C1 with Central 7 + SBS Qld will for the period to 31 January also be receivable in NZ on "some" receivers.

Observation: ABC data rates have been constant 5.3Mbit/s but on new 12.324/T1upper, rates are dynamic, down to 1.5Mbit/s.

BSkyB (UK) has launched a 140 channel FTA service package (called Freesat) for A\$345 (one time charge). Price includes digital STB, dish, LNB, cable, mount, *installation* and RCU. Package is in response to terrestrial offer of BBC promoted "Freeview" which has been a runaway success, recently passing 4 million homes connected. BSkyB's growth had been slowed by the Freeview success - what BSkyB is offering here is a FTA system, capable of being upgraded to BSkyB pay to view with a phone call. Their logic, apparently, is to counter the Freeview success, and, by placing BSkyB hardware in new homes at "cost" making it possible for British viewers to do satellite rather than terrestrial. The 140 channels are already FTA on Astra satellites - nothing here that anyone with their own system could not do on their own, without "Freesat" help. But the A\$345 price is very competitive (well below what FTA systems cost in Australia - or New Zealand).

naked NEWS

UNAOHM

S 20

Satellite Digital and Analogue Television Bit Error Rate Meter

The S20 is a new hand held Digital and Analogue satellite TV instrument. Its sturdy case is protected against falls and blows by a moulded rubber holster. Keyboard and RF input connector have been designed to withstand hostile elements like humidity and dust. Measurements include True Bit Error Rate, Signal Level, Digital Channel Power, Digital Carrier to Noise Ratio, Spectrum and Expanded Spectrum; presented on an wide screen graphic Liquid Crystal Display. Some routine measurements are executed Automatically, whilst others are simplified. An optional Network Identification Table card automatically identifies satellites and their orbital slots from data stream info. Frequency range is 920 to 2150 MHz.

Menus guide users through selection of functions that include powering an LNB, Programming QPSK reception parameters and Data Logger programming. 100 Program memories can store 100 different instrument settings.

An internal Ni-MH battery provides long battery life whilst life between charges can be extended by optional external battery packs. The instrument can recharge the internal battery whilst functioning from its external power supply.

Accessories included as standard are a mains power supply/battery charger and the moulded rubber holster.

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- **QPSK true BER and Digital C / N.**
- **Digital and Analogue measurements.**
- **Spectrum Analysis with two Markers and Full 10 MHz Span.**
- **MAX, MIN & FREEZE Hold functions for special signal analyses.**
- **View any 7 transponders simultaneously.**
- **Data Logger records Signal Level.**

Sold and serviced exclusively in Australia by

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SKY Pacific's challenges

"Reading your report (SF#121) concerning Fiji's new satellite service raises questions about the service's financial viability short and medium term. In my view, those in rural areas may go for it provided (1) they have mains power, and, (2) can afford the monthly fees. The urban areas, at least on Viti Levu, have a multiple channel pay over the air service already and as both the terrestrial and satellite are operated by Fiji TV, they are in effect competing with themselves. Perhaps the real opportunity for SKY Pacific is in areas with limited TV such as Samoa but I fear the cost of even the FTA single channel service (Fiji One) will be a serious challenge to folks that don't keep F\$500 or more hidden under their shredded coconut mattresses."

Bob Kennedy, Sigatoka, Fiji Islands
No question, there are challenges here which no previous DTH operator has faced, including widely varying power mains availability (village generators will be a serious technical challenge for IRDs), getting CA authorisation when there is no telephone link between the "installer" and the operations centre, and collecting monthly fees from people who have neither a bank account nor credit card. Add to that uncertain and very slow mail delivery and you have a recipe for problems only a very adventurous company would tackle. See update, p. 14 here.

Topfield is impressive

"Have purchased Topfield Tf3000 cip pro from Melbourne Satellites and am very impressed! You select a satellite from menu, it gives a list of frequencies and you move the dish until the signal level and quality on screen displays reach max. Then you skew the LNB/feed to max signal and that is it! Instant viewing. On bottom of menu screen is a display of previously locked satellites and indicator of direction of dish movement. Pretty neat!"

Joe, Foreign Satellite, Rowville, Vic.
With a remote control you can now access the world.

KAVA is in Solomons!

"Just back from completing major two-year project in Solomons and can correct Jim Ruhe (SF#122, p. 2); they do indeed drink Kava as part of their R and R. And 'Scratchi'? My guess is Garry Cratt (Av-Comm).

Satellite Man, NZ

That's funny - Garry guessed it was Tim Alderman in California and Tim guessed a fellow living in Hong Kong. *All wrong.*

HARDWARE EQUIPMENT PARTS

UPDATE

NOVEMBER 15, 2004

Bet you cannot guess which Pacific Islands country is the world leader in over the air COFDM digital pay-TV technology. Tonga. COFDM digital - just like the "big boys" in Australia and UK, but these folks are WAY ahead of those two! Tonga's government operated telephone firm (TONFON) has five TV channels multiplexed on American standards UHF channel 46 (666 MHz, centre frequency), a 1.25kW transmitter, covering distances as great as 50km (all of Tongatapu including 'Eua). The five channels are multiplexed in a Thomcast remultiplexer (capable of up to 8 transport streams simultaneously), Harmonic (brand) MediaView encoders with Irdeto Conditional Access (version 2) scrambler. Individual channels of the current 5 can be turned on and off for each Zinwell ZDT-710 MPEG-2 DVB-T CA (NTSC format) viewer location from a master control keyboard. Australia's COFDM terrestrial operators (ABC, SBS, 7, 9, 10) would "love" to have their government approval to add channels on a pay-to-view basis but it is unlikely to happen soon. New Zealand is still trying to figure out how to spell digital. The USA? Multiplex yes - pay? No. The UK? A wildly successful "Freeview TV" COFDM service but pay (and HDTV) are years away except in a test mode. Want to know more? *Stay tuned.*

AVCOM, (the spectrum analyser people in Virginia, USA), has appointed Patriot Antenna Systems (Albion, Michigan) as a "master distributor" for their product line including the popular PSA37 series. AVCOM's founder, Andrew Hatfield, sold his company to an investment group from Philadelphia (Pa) more than two-years ago and the company's direction has "coasted" (a polite term) in the interim. Patriot has been on a growth spurt acquiring related firms such as ADL (feeds) and Paraclipse (consumer and SMATV antennas) in an apparent effort to become a "one-stop shop" for satellite related hardware and systems. Patriot? www.sepatriot.com.

Sony's 1,000 gigabyte hard drive recorder; Vaio Type X, at US\$4,700, goes on sale in Japan (only). Device has seven built-in (analogue) tuners capable of recording up to 7 different channels 19 hours each for six days. The oldest recordings are automatically deleted to make room for the newest.

TVNZ Satellite Services disposing of 18m (!) uplink antenna (Wellington) plus other hardware and antennas across NZ and Australia, including two 13M near Perth. How big are they? One 13m requires two 40 foot containers just for the panels and super structure. Now - THAT is big!

Model numbers? Before you purchase what the seller claims is a "discounted price" on an expensive piece of test equipment, check the model number. *Closely*. Discounted pricing often suggests "old stock" being "dumped" by the distributor as he clears the shelves for the latest model(s). *Caveat emptor* - buyer beware!

Globecast installs for NZ? Contact Mark Lobwein, Sydney (+61-2-8258-7900); you supply quad shield, labour.



Phoenix Technologies



Satellite Equipment & Accessories One Stop Supermarket

Phoenix JT3100T Digital Terrestrial Receiver

- Digital Audio Output (S/PDIF)
- Dolby Digital
- Wide Screen (16:9) Hot-Key
- S-VHS, CVBS & RGB Video Outputs



- Super-Fast Channel Scan
- Electronic Program Guide
- Channel Rename Function
- Software Upgradeable

\$180/each (for 6 unit)
\$160/each (for 30 units)

Magix 8800 Receiver (Made in Korea)

\$220

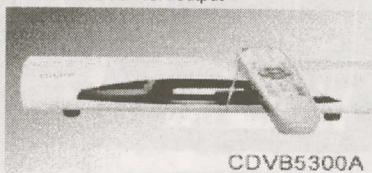
Coship digital receiver (Iredto V2.09 CAM embedded)

\$220

SPACE 5300A CI Receiver (Two Common Interface Slots)

Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$180



CDVB5300A

SPACE 2300 digital receiver

Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$140

NextWave 3220 FTA digital receiver (Made in Korea)

C & Ku band input, PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

\$160

NextWave 3220C digital receiver (Two common interface slots) (Made in Korea)

C & Ku band input
High symbol rate >45,000
PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

\$220

Irdeto 2.06B CAM	\$140	Zinwell C band LNBF	\$35
Viaccess CAM	\$140	Zinwell 10.70/11.3	\$25
65cm offset dish	\$27	/Universal Ku band LNBF	
75cm offset dish	\$40	MTI C band LNBF	\$35
Superjack DiSEqC 1.2 motor	\$95	One cable solution C-band LNBF	\$50
Universal Mount	\$15	Satellite finder	\$30
2.1m mesh dish	\$120	Silver Card (10/bag)	\$125
2.3m mesh dish (motorized)	\$170	Gold Card (10/bag)	\$85
2.4m heavy duty mesh dish (motorized)	\$210	RG6 Stripper	\$20
1.8m 6 panel dish	\$130	RG6/11 Crimper	\$30
RG 6 Dual cable (305m/roll)	\$75	Angle meter (made in USA)	\$85
		Compass	\$30

Optus C1 Aurora Kit Coship digital receiver

(Iredto cam embedded)
11.3 GHz/Universal Ku
LNBF, 75cm dish, Mount
bracket

\$315/set

+Aurora card \$75

LBC, ART, Al Jazeera Kit Coship digital receiver

(Iredto cam embedded)
C-band LNBF, 2.3m
Mesh dish.

\$435/set

+Subscription fee
\$20/month*

Free to air kit (for NSS 6, Optus B3)

Including dish, LNBF,
digital receiver, etc.

**Start from
\$250/set**



Changhong 1000 Digital Receiver Aston 1.05 Cam embedded

Best Value For Indian & French
(C-band on Asiasat 3s & Ku
band on Intelsat 701)
C & Ku band input, 2000
Channels.

\$170

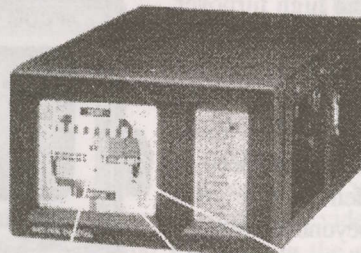
(Top quality) TESTING EQUIPMENT SPECIAL (made in Sweden)

Satlook MARK III \$950

- 4.5" B/W monitor for PAL/NTSC/SECAM
- Satellite-receiver 920-2150 MHz
- Tunable sound 5.5-8.5 MHz
- Spectrum analyzer
- Expanded spectrum
- LNB voltage 13/18 V
- 22 kHz tone switch
- KU- and C-band (normal/inverted video)
- Built in rechargeable battery
- Only 3.5 kg complete with carrying-case

Satlook Digital NIT \$1550

We are pleased to introduce our new SATLOOK Digital NIT. NIT stands for NETWORK INFORMATION TABLE, which today almost all DVB-satellites transmit as standard. The NIT contains information about the Satellite and TV/Radio-channels. It's very easy to identify a Satellite when reading out this information. The different TV/Radio-channels on a transponder can also be read-out.



Satlook COMBO \$2550

- Input frequency: 2-900 MHz and 920-2150 MHz
- 4.5" B/W Monitor for PAL/NTSC/SECAM
- Lots of memory positions for spectrum pictures
- RS232 for PC-connection
- Built in, rechargeable battery. Only 7kg complete with carrying case
- TV-PART:**
 - 2-900 MHz spectrum analyzer
 - Presents full range spectrum (and expanded)
 - Very high accuracy, $\pm 1\text{dB}$ (at 20°C)
- SAT-part:**
 - 920-2150MHz spectrum analyzer. Digital BER, QPSK and S/N-ratio
 - Satellite-ID and TV/Radio-channel info (NIT)
 - Tunable audio bandwidth 5.5-8.5MHz
 - LNB voltage 13/18V, 22kHz tone switch
 - DiSEqC according to level 1.0, 1.1, 1.2
 - KU- and C-band (normal/inverted video)

Full range of C/Ku band satellite dish - panel & mesh, prime & offset, from 45cm to 4.5m
Full range of Zinwell, MTI C/Ku LNBF - Dual output, one cable solution, C/Ku combination
Full range of actuator - From 12" light to 36" heavy duty
DiSEqC 1.2 Positioner & SupperJack EZ2000 Positioner
2.4 GHz AV sender and Remote extender
RG6 Cable and Motor cable

Full range of satellite accessories



THIS MONTH SPECIAL



SPACE 2300A FTA Digital Receiver \$1300/(10 units)
Magix 8800 Digital Receiver \$1200/(6 units)

Phoenix 2.3m Mesh dish \$1650/(pallet of 10 sets)
Zinwell LNBF 15K C-band LNBF \$648/(box of 24 units)

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E-mail: sales@phoenixsatellite.com.au

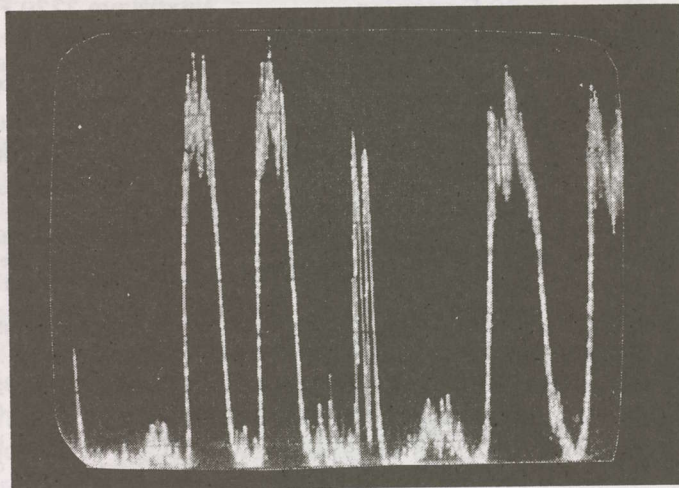
This "Brick" is a building block to higher quality digital reception

In the satellite world, there are typically four levels of achievement: (1) passing but hardly noteworthy, (2) good, (3) better, and, (4) best. An individual can earn a living, provide acceptable service, and generally be successful at any of these levels. Those who provide "passing" skills usually know their limitations, and accept work only when it fits their skill level. Progressively, those with greater skills accept more complex assignments comfortable they are well enough "equipped" to resolve any challenge encountered.

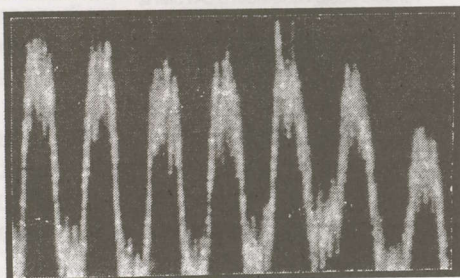
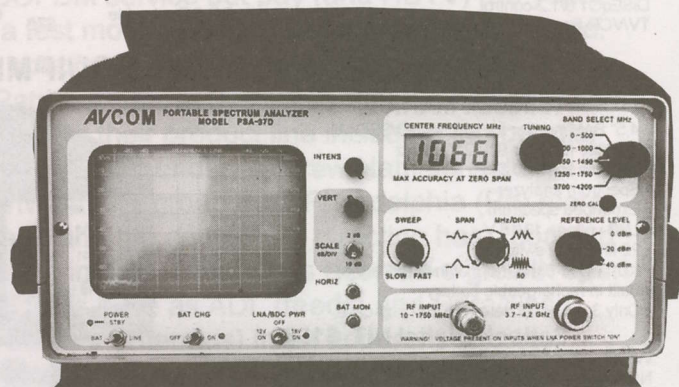
"Equipment" comes in many forms including, of course, skill level based upon experience. And experience with new skills comes from being exposed to new technology and the hardware (equipment) that supports the latest developments. It would be incorrect to describe "satellite TV" as a static, non-developing field of endeavour for as these pages relate monthly, the technology continues to expand, change, and become more complex. Thus there is always something new to learn, some new skills to acquire.

A proper digital (DVB-S) satellite terminal installation must take into account a variety of disciplines which may or may not require skills greater than the "passing" level. Sticking-in Foxtel/Austar/SKY NZ/UBI et al Ku band systems are, by design, at the bottom of the "skills-required" basket. One can learn 90% of what he (or she) needs to know in 4 hours or less which partially explains the high turnover of those working in this field. No effort expended, no dedication to the task at hand. Next month, shearing sheep.

Progressing beyond "passing" requires effort and commitment and for something exceeding half of those entering the industry, it is easier to go back shearing sheep or holding a "lollipop" as a traffic warden for a road construction gang than to actually move beyond "passing." This report, while ostensibly about test equipment, is really



A spectrum analyser is a handy, often required tool, when initially searching for a satellite. A simplistic in-line meter that converts incoming signal level(s) to a display (meter or LED) is also helpful (below) but it is limited in application when attempting to wring the last part of a dB out of a dish adjustment exercise.



Analyser

Plus: See full band simultaneously, or down to one carrier; identify "format" (SCPC, MCPC, analogue); locate satellite (or TI); some include analogue TV viewing, identify "cross-pole" signals/feed settings.

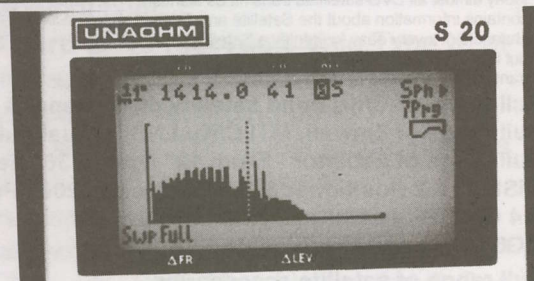
Negative: Bulky device, limited battery use, cannot measure digital "errors," +/- 1 dB peak error; LNB (typically) control limited to 14/18V switching.



Inline Meter

Plus: Simplistic to use, inexpensive, small.

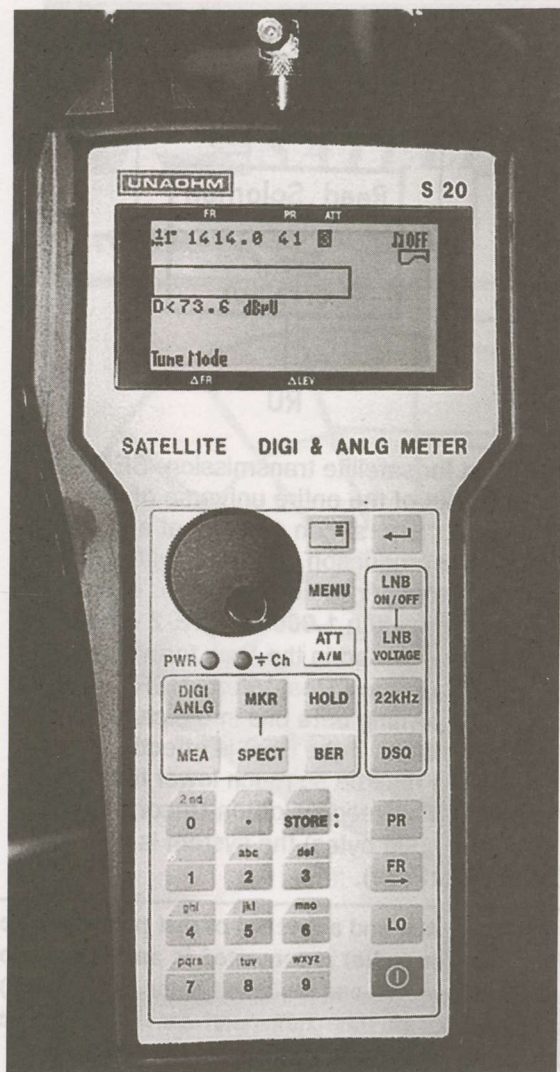
Negative: "Detects" full L-band as one reading, levels are "relative," not "real"; cross-pole setting "tricky"; no LNB polarity switch.



(Satellite) Digital/Analogue Meter

Plus: Spectrum (LCD) display built-in from full bandwidth to 10 MHz; powers LNB, 22 kHz and DiSEqC; signal level to nearest tenth dB, frequency to nearest tenth MHz; auto analogue-digital; adjustable marker allows direct "A" and "B" level and frequency on screen comparison; levels of BER: accumulated Reed Solomon error count; hand portable; service ID.

Negative: Battery use limited; 8 hour battery recharge; no "image" viewing.



Unaohm S20/Capsule

920-2150 MHz

- ✓Analyser span 10, 20, 50, 100, 200 & full
- ✓5 MHz selectivity
- 20>-40 dBmV range
- ✓0>30 dB attenuator, 10 dB steps (+/- 2 dB)

Frequency Tuning

- ✓PLL, 125 kHz steps
- ✓by software
- ✓Readout to nearest 0.1 MHz

Display/LCD 128 x 64

Histogram

- ✓Bargraph

- ✓on-screen text

QPSK Parameters

- ✓Sr 1.45>36 MS/s
- ✓FEC automatic
- ✓AFC +/- 10 MHz
- ✓"Locked," "Unlocked," "No carrier"
- ✓Channel BER, pV BER, MER, RU

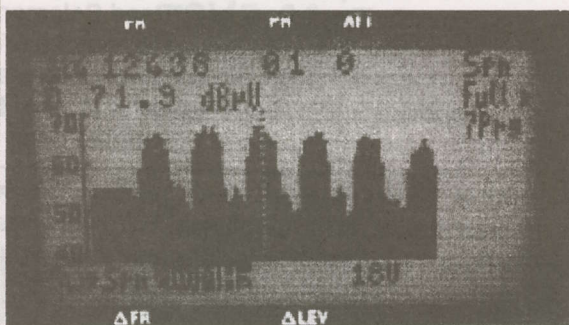
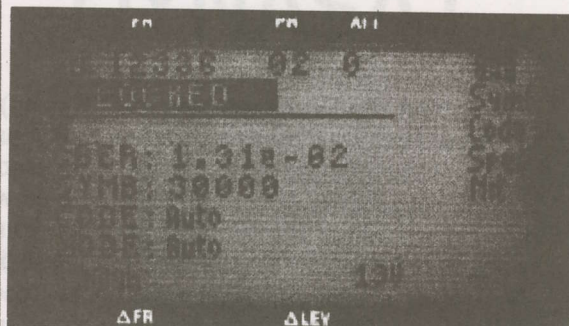
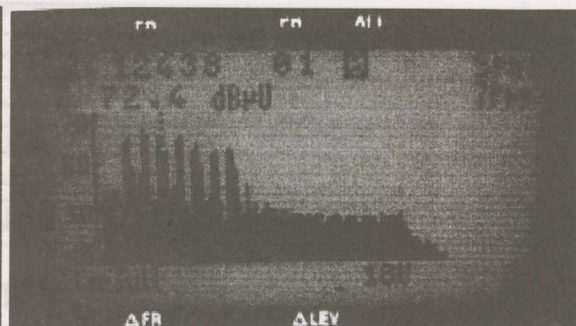
LNB Powering

- ✓0, 13, 18V
- ✓22 kHz
- ✓DiSEqC 1.1

Batt run time: 90 min

Batt recge: 8 hours

Weight: 0.9 kg



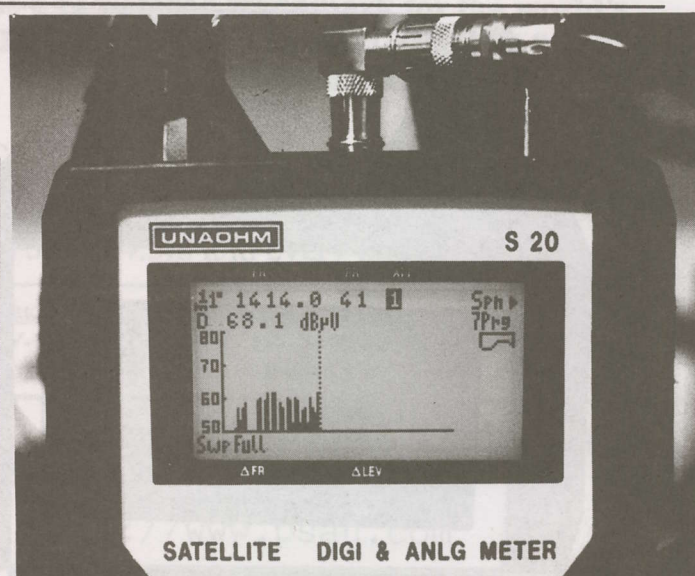
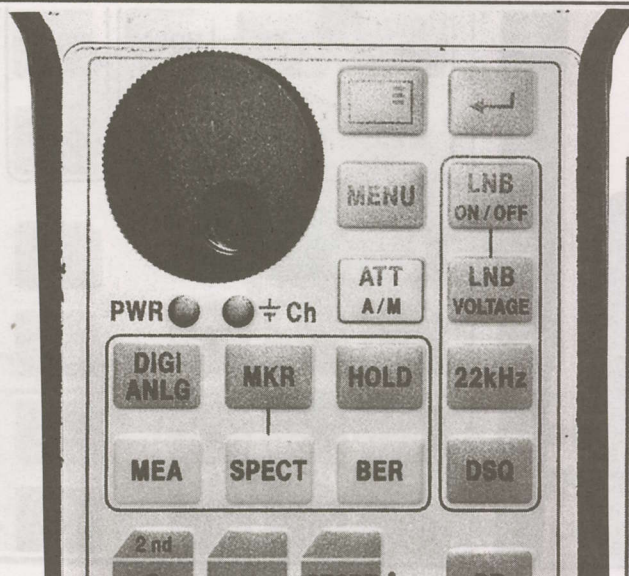
more about human resolve, to find a reason to go beyond the four hours required to learn the basics of "passing grade" installs for the Ku band services.

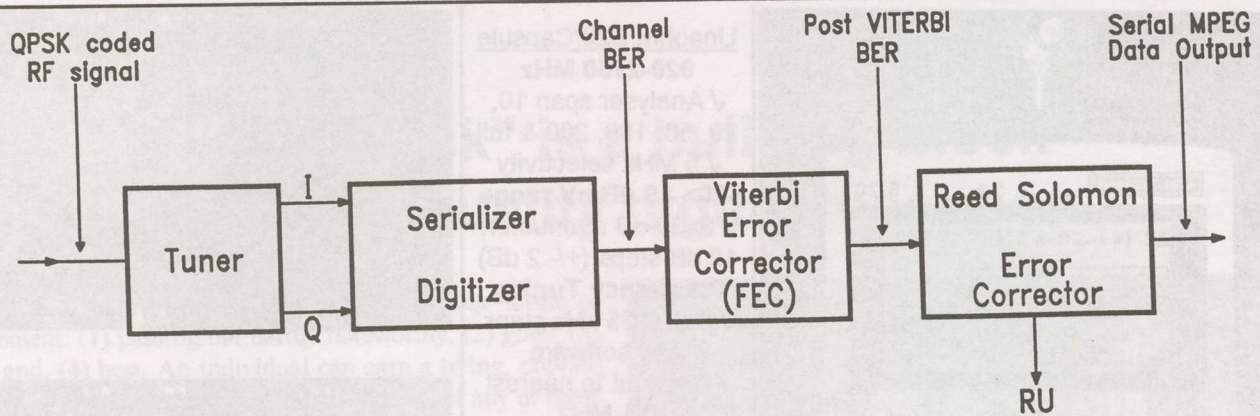
Digital basics for newbies

A (satellite based) transmitter, to convey information, must have the original video + audio (so-called "baseband") information implanted onto a "carrier." This process is known as modulation. In analogue transmissions, the "carrier" is modified by the modulation information such that

when receiving the transmission, the "modification" of the carrier comes out as the original (baseband) video + audio. Analogue satellite uses frequency modulation (FM) as a modification format which means the actual transmission frequency is "warbled" (changed) at a rate that represents the implanted video + audio. Demodulating FM depends upon detecting the pattern of the frequency "warble" - reversing the modulation process used at the transmitter.

Digital transmission involves a modulation process known as "QPSK" which is to FM as a GT racing vehicle is to a





QPSK (Quadrature Phase Shift Keying) is a modulation format employed for satellite transmission. BER (Bit Error Rate) is a measurement of how many "bits" (individual bytes of data) out of the entire universe of data-bits making up a transmission are "corrupted" - usually by noise or interference. "Errors" can creep in at any stage between the origin TV camera (even within the camera itself), through the production centre, or within any microwave or satellite links between you and the source. BER is read in "errors per (a number)" - for example, $1E-5$ equates to 1 Error in each 100,000 data bits while $1E-3$ would be 1 error in each 1,000 bits ($1E-2$ would be 1 error in 100). In the above diagram (courtesy Unaohm) the "error rate" is measured in the "raw form" (called "Channel BER") and then separately after the (Viterbi) Error Correction (FEC) stage ("Post Viterbi BER"). FEC is an attempt to "fix" (correct) corrupted data-bits prior to the demodulation (turning data bits into picture and sound). There is more - "Reed Solomon" correction follows the FEC/Post Viterbi. If the FEC is effective (as it must be but with varying levels of performance), the pV BER (Post Viterbi) may be so much lower than the "Channel BER" that it can only be read over long periods of time (the "RU" - Reed Solomon Uncorrected measurement). Bottom line? If the "pV BER" is $1E-4$ or better (1 error in 10,000 bytes) the system is typically termed good (in the trade - "QEF" for Quasi Error Free).

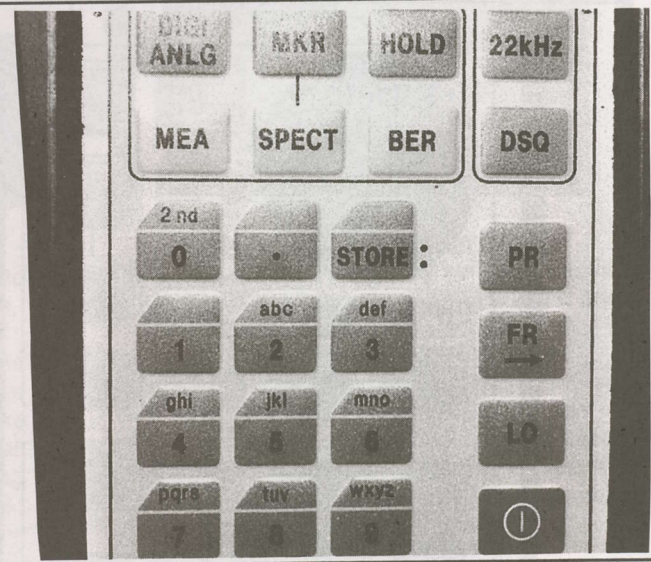
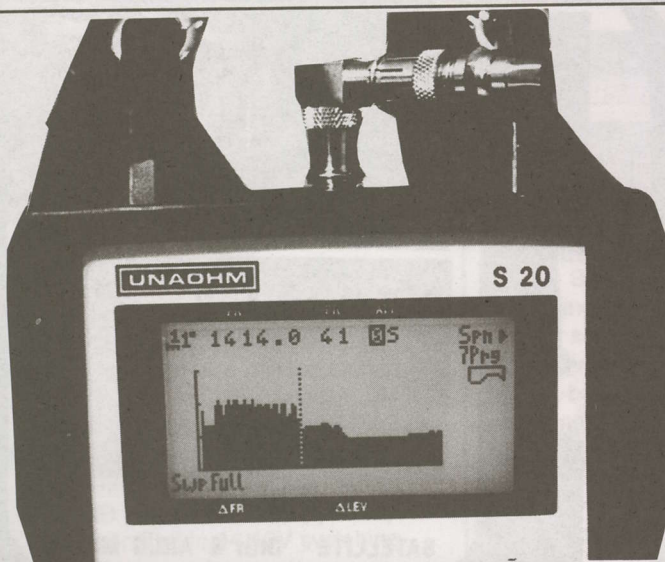
1930 Model T Ford. Both function following the same constraining laws of physics but one takes advantage of decades of improved technology and is therefore more efficient.

Analogue FM requires a "carrier" before there can be modulation implanted. QPSK has no equivalent "carrier" although it does have something similar - "channel bandwidth." A carrier has a specific, by-design, frequency and before you can demodulate the analogue signal you must discover the frequency. QPSK, lacking a "carrier," has a "spread of information" occupying a by-design bandwidth. To demodulate the QPSK (i.e. extract the "hidden" modulation information) your receiver must be tuned to the appropriate channel bandwidth. Moreover, digital relies on a conversion

process at the transmitter and a reversal of that process at the receiver. The video (or audio) is converted in an analogue to digital (A to D) "converter" and the result is the "D" (digital) format that comes out of this conversion can no longer be recognised (demodulated) by an analogue receiver.

Digital is more "robust" than analogue simply because for each individual picture element (pixel) there are two states possible: "On" and "off." Analogue pixels have hundreds (indeed thousands) of possible states and creating a blemish-free image on the screen demands that the analogue demodulator get the content of that pixel's modulation precisely correct. Digital only requires that the receiver correctly interpret whether the "digital data bit" is turned "on" or "off"; a 50-50 shot. (1)

1/ YES - this greatly oversimplifies how digital works but this is the "newbie class!"



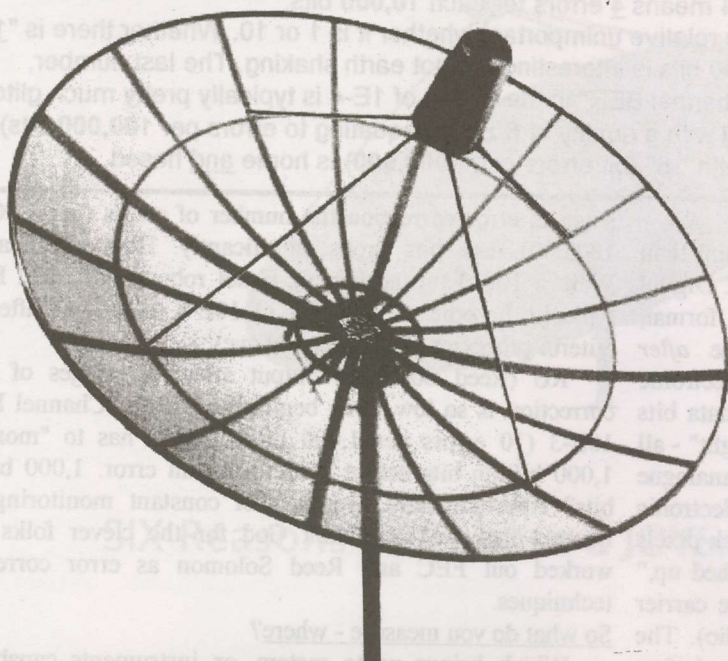


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Demystifying "BER"

Bit Error Rate should not be confusing. It works with powers of 10/100/1000. BER is a measurement of errors (bit errors, to be concise). A "bit" is a minuscule part of an image, a "dot" on the screen that turns into some colour on command. If a "bit" is lost, for whatever reason (including a dodgy LNB, dish or feedline), it is up to the FEC ("Forward Error Correction") to "fix" that damaged "bit." BER numbers work upwards: 1E-3 means 1 error in each 1,000 (the "-3" here represents three 0s; 1,000) whereas 1E-5 means 1 error in each 100,000 (the "5" represents five 0s; 100,000). Therefore 1E-5 is better signal "quality" than 1E-3. Numbers like 4E-4 and 5E-6 are confusing because they don't fit easily into our "linear mind." Read the last number and think of it as that number of 0s; 4 represents 10,000 (4 zeros) while 6 represents 6 zeros (1,000,000). The first two numbers are the numbers of "errors" per bits. 4E-4 means 4 errors for each 10,000 bits.

The number preceding the letter "E" (errors) is relative unimportant whether it is 1 or 10. Whether there is "1" error per 10,000 bits or 10 errors per 10,000 bits is interesting but not earth shaking. The last number, representing 0s, is your primary concern. A "Channel BER" in the region of 1E-4 is typically pretty much glitch free after the FEC and RU corrections. A signal with a quality of 5 zeros (equating to errors per 100,000 bits) is "home free" territory and anything with "-6" (bit errors per 1,000,000) is home and hosed.

Error correction

However, there is more to the "robustness" of digital than the improved odds of "getting it right" at the receiver. Digital can be corrected, while still in its raw data-stream format, whereas analogue "correction" can only be done *after* demodulation. Think of digital correction as an electronic policeman standing at a street corner nudging the data bits passing by to "get back into line" and "stand up straight" - all *prior* to reaching their destination. Now envision analogue modulation elements passing by the same electronic policeman who can only watch helplessly as the slack pixels flow by. "Corrupt" analogue data can only be "touched up," electronically, *after* demodulation (conversion of the carrier plus modulation back into baseband video and audio). The difference here is substantial - digital fixes *before* demodulation while analogue comes back *afterwards* with a touch-up brush trying to cover over the errors post-demodulation.

Digital uses a redundancy technique to enhance "error correction" and not-by-coincidence the "F" in FEC stands for "Forward." Think of *Forward Error Correction* as a technique for transmitting the original information more than once - on the theory that if the receiver misses the original data bit the first time the stream flowed by the policeman, it will have a second (additional) shot at catching it when it repeats. FEC "1/2" means that for every digital data bit transmitted ("1") there will be two ("2") shots at it. FEC 7/8 means that for every 7 data bits ("7") there will be a total of 8 ("8") passes. The programmer determines the FEC rate based upon an engineering decision reached prior to launching service.

What this does is offer the opportunity for the BER (bit error rate) to be measured at several points in the transmission stream: (1) Channel BER which is "raw" data stream, (2) Post Viterbi which is after FEC correction, and, (3) "RU" or after Reed Solomon error correction. All of this can be done on any digital data stream, whether FTA or CA, without actually demodulating (turning the data stream back into visual and aural). However, very significant numbers change between "Channel BER" and "RU"; the first is filled with errors, even when the signal appears perfect, because as noted errors creep in starting at the digital TV camera and then at each successive processing/transmitting stage on the way to your receiver. Many of these errors cannot be corrected - they are simply accepted. Others can be "polished" with the FEC and Reed Solomon processing but with each

stage of error correction the number of errors (per 1,000 or 100,000) data bits drops significantly. How significantly? Well, a 10E-3 (an acceptable if not robust) "Channel BER" typically becomes a pV BER of 10E-8 to 10E-11 after the Viterbi processor (10E-3? See above).

RU (Reed Solomon) output after two stages of error correction is so low, even beginning with a "Channel BER" 10E-3 (10 errors per 1,000 bits), that it has to "monitor" 1,000 billion bits before it identifies an error. 1,000 billion bits? Approximately two days of constant monitoring (48 hours). Yes, we can thank God for the clever folks who worked out FEC and Reed Solomon as error correction techniques.

So what do you measure - where?

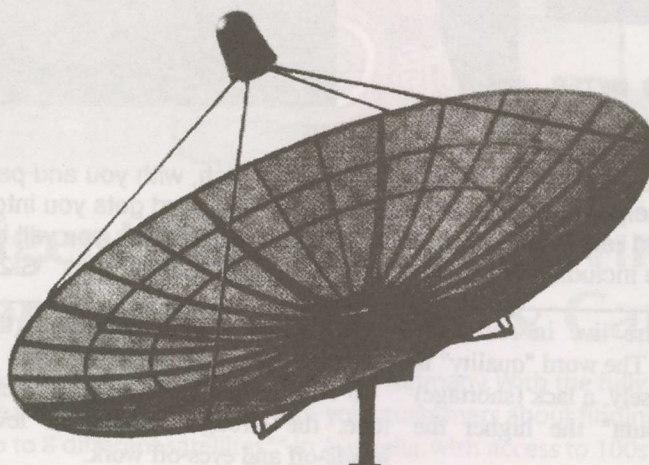
Which brings us to meters, or instruments capable of detecting errors. Here you sit on someone's summer-sun-hot tin roof, your bum is burning, and you are anxious to get the hell off and back to the ground. But first you need to ensure that the signal you have intercepted is as good as it gets - as few errors as possible. Because over time, when it rains, and the clouds cover the sky, causing the Ku band signal to drop, the skill you exhibit peaking the dish for maximum signal AND minimum cross polarisation will be the foundation for that dish's performance.

So would you measure "Channel BER" or "Reed Solomon" errors? If you answered Reed Solomon because it is the accumulated errors over time, we hope you packed a lunch (and a dinner, breakfast, second lunch, second dinner and second breakfast) because you are going to be sitting on that roof for a very long time waiting for the RU's to accumulate. Obviously "Channel BER" is a better answer because it is "short term" error, measurable at the dish/LNB while your bum is coming up to temperature on the tin roof.

Which gets us to measurement techniques (you knew we'd get here - *eventually* - Peter!). It is possible to create a meter that reads virtually any point in the digital data stream processing sequence. It is also possible, as with the inline meter and the spectrum analyser, to create a "relative signal level" indicating instrument that pays no attention to "error rates" and in lieu of this simply concentrates on "maximum signal level" without regard to the "quality" of the actual signal.

Quality is a new word, here. It means, forget how strong the signal is or is not; the final "robustness" of the image on the screen and the sound from the speaker depends not solely on "signal level" but rather requires some fine tweaking that

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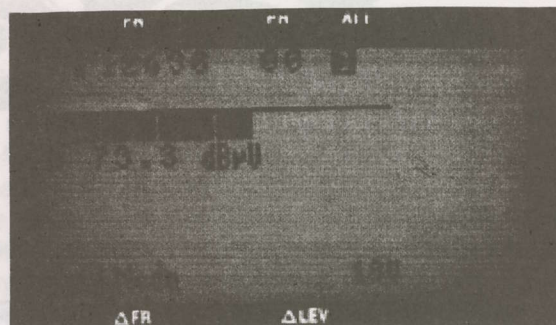
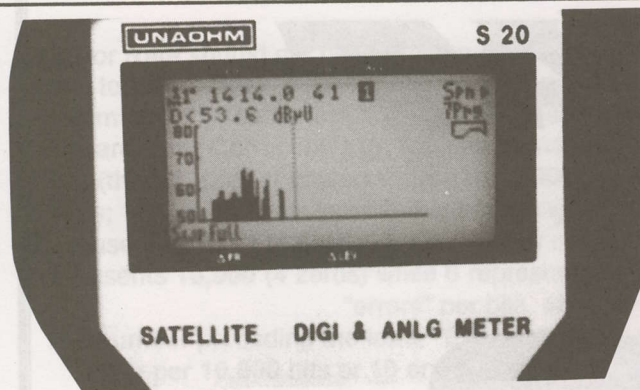
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ONE of the S 20 "pluses" is that you can take it onto the roof, to the dish, with you and perform every function you might do from inside at the receiver (switch polarity, etc.). The keyboard gets you into menus which in turn get you to the desired functions and readouts on the LCD screen. With practice, you will be able to complete a dish peaking exercise including cross-pole nulling in about two minutes "S 20" time.

can only be done accurately if you are live in real time monitoring the data stream for "errors." The word "quality" is the final result of "errors" or more precisely, a lack (shortage) of errors. The *smaller* the "error count" the higher the *quality*.

When initially installed a 10E-3 (10 errors per 1,000 bits) might look high quality, just this side of "perfect." But lacking the ability to properly peak the signal for (1) maximum signal level, (2) minimum cross polarisation degradation, (3) minimum earth and surroundings noise contribution - little do you know that you are with 0.3 to 0.5 dB of no signal at all! The ragged edge of not working. The weather is fine, and you hit the road comfortable that you have done a "good" job. Not quite - it is borderline "passable."

Metering - passport to excellence

An installer can "get by" with an inline meter provided: (1) There is no cross-pole (signals on the opposite polarity) to "null"; (2) the LNB(f) is working to its design parameters; (3) the feed (when using a separate LNB and a mateable feed) is the correct-by-design feed for the dish; and, (4) you are either very lucky or have exceptional skills.

A spectrum analyser is another level of skill because it provides a visual display of the signal(s) to be received and sufficient display "metering" to make it possible, with training, to correct for (1) cross-pole, (2) detecting that a particular LNB/LNBf is not performing properly. With exceptional skills (read: "experience") a spectrum analyser will also point you towards determining whether a specific combination of feed and LNB are correct for each other.

But, neither of these approaches actually confirms for you that all elements in the digital data stream are performing to the maximum possible level of service. This is all about "headroom" - creating "extra" margin of "quality signal" so that as a system ages, when there is heavy rain or wet-moist cloud cover, the receiving system continues to perform. To do this with a level of confidence demands that you know the all-mystifying "BER" or bit error rate.

Demystifying BER is treated here (p. 10). The BER measurement technique is basically backwards to logic. There is help on the way. It comes from Unaohm and at 0.9kg it fits into the palm of your hand whether you are on a tin roof, standing in a paddock and sitting comfortably at a work bench. It does:

- 1/ BER (we'll explain)
- 2/ Signal level (in the familiar dB format)

3/ Visual display indication (think of it as a spectrum analyser you can fit into your hand)

4/ Aural tone (you've seen this before - the higher pitch the tone, the stronger the signal level being measured) for hands-off and eyes-off work.

And because it is battery operated (typically 90 minutes operating time per charge) it goes with you where the dish and LNB(f) are located. Yes, it can also operate indoors from a combination charger/mains supply and yes it will power the LNB(f) from either source. Oh yes - it does analogue as well should you have occasion to run across satellite FM transmissions in your work.

The Unaohm S 20

Our "bottom line" first - if you can afford the S 20, you cannot afford *not* to own it. Even if you have to go into debt for a period of time to finance the purchase (a rental plan is also available; contact Lacey's.tv for details). It is that good, and it will make your installs so much more professional (and quicker to complete) that the S 20 will pay for its expenditure cost in a short (well, reasonable!) period of time.

That's the good news and our recommendation comes with no strings attached. Bad news? "Getting to know you ..." will be a challenge, for some. If you are comfortable with an inline, frightened of a spectrum analyser, plan on perhaps a day of intensive hands-on education. If you can already handle an analyser, a few hours will do it. What we would like to see (and herein suggest to Lacy's TV) is that their Pietro Casoar, who has done SPACE Pacific training tapes in the past, create one for the S 20. It is all about "comfort level" - providing potential users with a degree of understanding and assistance that will ensure they won't be purchasing a new toy that confounds and disappoints after it comes out of the shipping carton. A one hour video tape created by the crew at Lacy's with Pietro's experience can make this happen.

The S 20 is essentially a measurement tool built into a satellite receiver. Most satellite receivers have the ability (if not the software) to tell you pretty much what the BER tests do in the S 20. A handful of receivers (SA models, for example) provide the BER number (such as 1E-4) but none include a display function (the "spectrum" part) nor a number of other S 20 features. Here's one we especially like.

Twin markers. A "marker" is a frequency-known signal generated inside the S 20. The original concept of a marker is that by placing a machine-generated signal on the (spectrum)



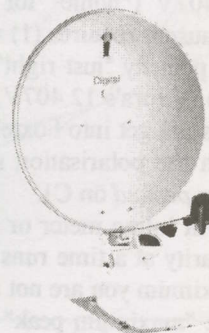
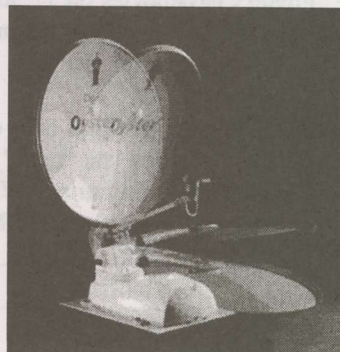
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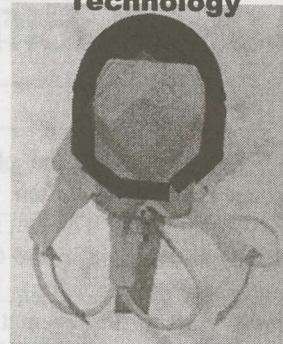
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|---------------|-----------------|
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| 2) Optus B1 | 6) NSS 6 |
| 3) Optus B3 | 7) MeaSat |
| 4) PanamSat 2 | 8) Intelsat 701 |



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display, you can calibrate and calculate the actual frequency of the signal being received. It is often useful to know the difference between Hubei TV (4035H, As3S) and Sichuan TV (4051H, As3S), especially if your client wants Hubei and could care not a diddle about Sichuan. The marker allows you to identify which is which, and the signal level of either of the two - in dBuV/dBmV/dBm - as well as the actual BER of either of the two. In the S 20, there are two markers. In most spectrum analysers, the markers are "fixed" (every 50, 10 or 1 MHz) and you are left to your extraordinary skills to calculate and calibrate an actual spectrum-displayed frequency by guesstimating the "space" between say 50 MHz fixed markers. You can do it - but you won't identify the correct answer 100% of the time.

The S 20 has two "markers" and both "move," with a dial. You select either #1 or #2 from the menu and then turn a dial to make the selected marker "move" on the screen until it sits directly over a signal. Now it tells you (1) the identity of that signal (oops! *not Hubei as you had guessed* - it is actually Qinghai at 4067H!), (2) the signal level in the selected dB format, (3) the BER of the signal. *It gets better.*

Say you are trying to peak the dish system on two signals - for example, 12.558H on C1 ("home" for Foxtel/Austar) and 12.407V ("home" for Aurora). This one could be a trick because it requires (1) voltage switching the LNBf, (2) getting the polarity "just right" so that Foxtel's 12.398H does not get into Aurora's 12.407V, nor, Foxtel's pay-movies on 12.567V does not get into Foxtel's 12.558H. The installer adjustment is with the polarisation setting of the LNBf after the dish has been peaked on C1.

An inline meter or spectrum analyser looking at only one polarity at a time runs the real risk that when you "peak" for maximum you are not actually "nulling" for minimum." Why? The "maximum peak" is far broader (10-15 degrees of LNBf

rotation) than the null *minimum* (2-5 degrees of LNBf rotation). Think of it as an analogue watch: Peak occurs anyplace between 00 minutes and 15 minutes on the dial face while minimum is as small as 2 minutes on the same face - more or less in the "middle" of the maximum.

An inline or spectrum analyser will broadly indicate maximum but neither (and in particular the inline) will correctly define (identify) the very narrow 2(-5) degree twist of the LNBf that identifies "minimum."

The S 20 will do this, cutely and correctly and quickly by simply allowing you to switch from BER on 12.558H on to BER at 12.407V. BER, you see, is badly hammered by cross-pole and if you are twisting the LNBf for maximum BER on 12.558H and then cross-checking with the BER maximised on 12.407V, you know (without a doubt) you have found that very narrow 2 degree slot that represents cross pole nulling.

Which does what for you?

Makes you a "better" or "best" installer because this particular install will not come back to haunt you (supervisors can be a pain in the rear end - right!). And if you are doing installs as a private contractor, not affiliated with Foxtel/Austar/Sky NZ/Sky Pacific - well, getting the polarisation "right" will eliminate unpleasant call backs at 8PM on Friday evening.

The S 20 is a total machine, held in the hand, capable (with *you* making an effort to learn all of its' tricks) of keeping you out of trouble for any level of install; even SMATV (cable). But the emphasis here is on *you* making an effort to utilise (if not actually understand) the "tricks" that it does. The source is Lacey's.tv (12 Kitson St, Frankston, Vic. 3199; tel ++61-3-9783-2388; fax ++61-3-9783-5767; Email info@laceys.tv); and the price? AUD\$2198.00, + GST (inside Australia). *Part two in SF#124.*

Fiji TV's "Surprise" quandry

Sky Pacific may be C-band on I701

UPDATE: See p. 27!

When you use the phrase "DTH" you think "direct to home" and more often than not, you visualise Ku band 60-90cm dishes. The fact is that *all* DTH is sensitive to signal level, whether it is on C, Ku or even 2.6 GHz (such as Indonesia's Indovision). Indovision? They do well enough with 80cm dishes, even at 2.6 GHz. (equal to a 1.2m at "3.7")

In fact, some Russian satellites have been so strong at C-band that even a 30cm dish would work; today, in North America at boresight, C-band dishes in the range of 90cm work. That IS C-band - 3.7 - 4.2 GHz. All it takes is a signal in the region of 40 dBw - not an impossible number, even at C-band.

Signal level determines dish size. At C-band, if 40 dBw equals 90cm, what is the (90cm) number at Ku? The answer is 44.5 dBw.

Fiji TV had been promised boresight 90cm dishes for NSS-5 (177E) at Ku. This was the basis that allowed Fiji TV to move ahead - from a paper plan - to negotiate a contract with New Skies (NSS) last March. That was prior to New Skies "changing their mind" and suggesting Fiji TV "go

away" - simply walk away from their satellite plan, after NSS found a more profitable user of the NSS-5 spectrum space. As SatFACTS has reported (SF#121, #122), New Skies told Fiji TV to, "get stuffed." It took a Dutch Court, acting on a case brought by Fiji TV, to finally (on the second appeal) in mid-August say to New Skies - "Hold on - they were promised certain coverage using one of your satellites. Now - produce it for them."

The C-band solution

So, if you find a C-band (3.7 - 4.2 GHz) transponder that can generate say 40 dBw, should Fiji TV care? A 90cm antenna is a 90cm antenna, whether it is used at C or Ku. Well, in fact, New Skies did not identify a 40 dBw C-band signal - what they found was 38.5 dBw using a "spot beam" on I701 (180E). The difference between 38.5 and 40 dBw? A "mere" 1.5 dB. Which translates to? The difference between a 90cm antenna and a 1.2m antenna. Is it anything more than "slightly more expensive" - for Fiji TV's installation package?

This may surprise you. During 2003, slightly more than 12,000,000 antenna systems (including dish, mount, LNBf)

were manufactured and sold. For Ku band. And for C-band? 1,500,000.

Now, what about per-system costs? Well, Fiji TV found that at their planned quantity of terminals per month, the NSS-5 Ku "antenna package" (90cm dish, LNBf, "Universal mount") came in at A\$62 each. Fiji TV expected to pay that cost per terminal when it agreed to NSS-5.

The C-band antenna system would be 120cm (1.2m). Bigger? Yes; by 30cm. Ku is offset, C-band is prime focus. How much more money would a 120cm antenna cost than a 90cm? The answer, even in thousands quantity, might surprise you; times 2+, turning A\$62 per system into more than A\$125 per system. OK - so C-band prime focus costs more than Ku-band offset - 90cm versus 120cm. Is that it?

Not quite.

The Ku band signal is *linear* (vertical, or, horizontal). The C-band signal from I701, as proposed, would be *circular*. And that means?

12,000,000 linear polarised Ku-band terminals get to A\$62 each because of volume. But a few thousand C-band 120cm antennas each equipped with a circular polarised feed?

Garry Cratt of AV-COMM. "Circular feeds, with built-in quarter-wave ridges, to make the C band feed circular, are not a mass produced product. If you go out looking for one, you find Patriot and (a few) others and the price is in the region of A\$200 each." That's a minimum. The Ku band (linear) feed, whether attached to the LNB or standing alone, is closer to A\$5. That's a *huge* difference!"

The "A\$125 is *less the feed*" because right now, today, you cannot buy one for a cost per unit even close to the minuscule A\$5 each of Ku band. The bottom line is that virtually - actually - *no firm* makes a cost effective circular feed. Only

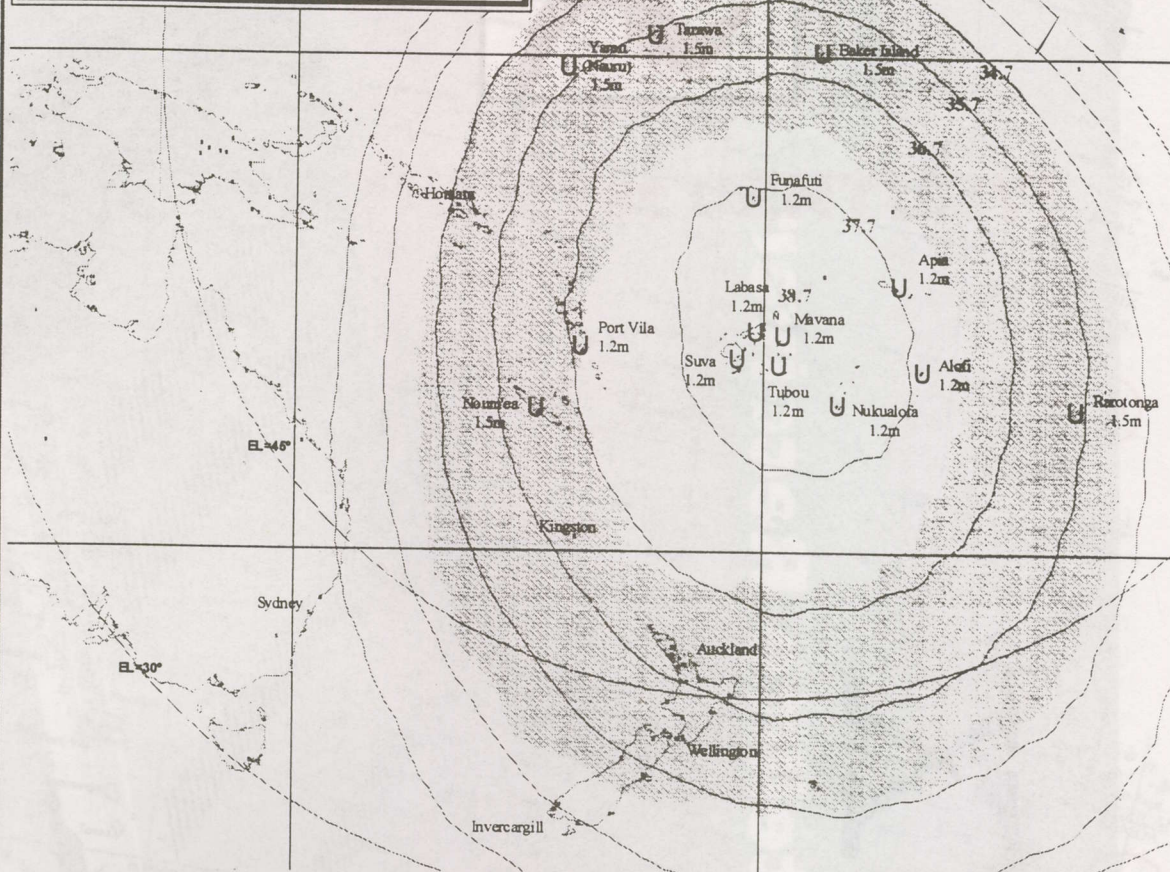
Above: I701 C-band spot beam coverage but only out to 2.1m contour. Right: NSS-5 antennas (Ku) versus I701 Spot Beam coverage to selected locations. Add 3 dB (2 antenna sizes "up") if getting by with a linear rather than circular feed.

C to C Band Service

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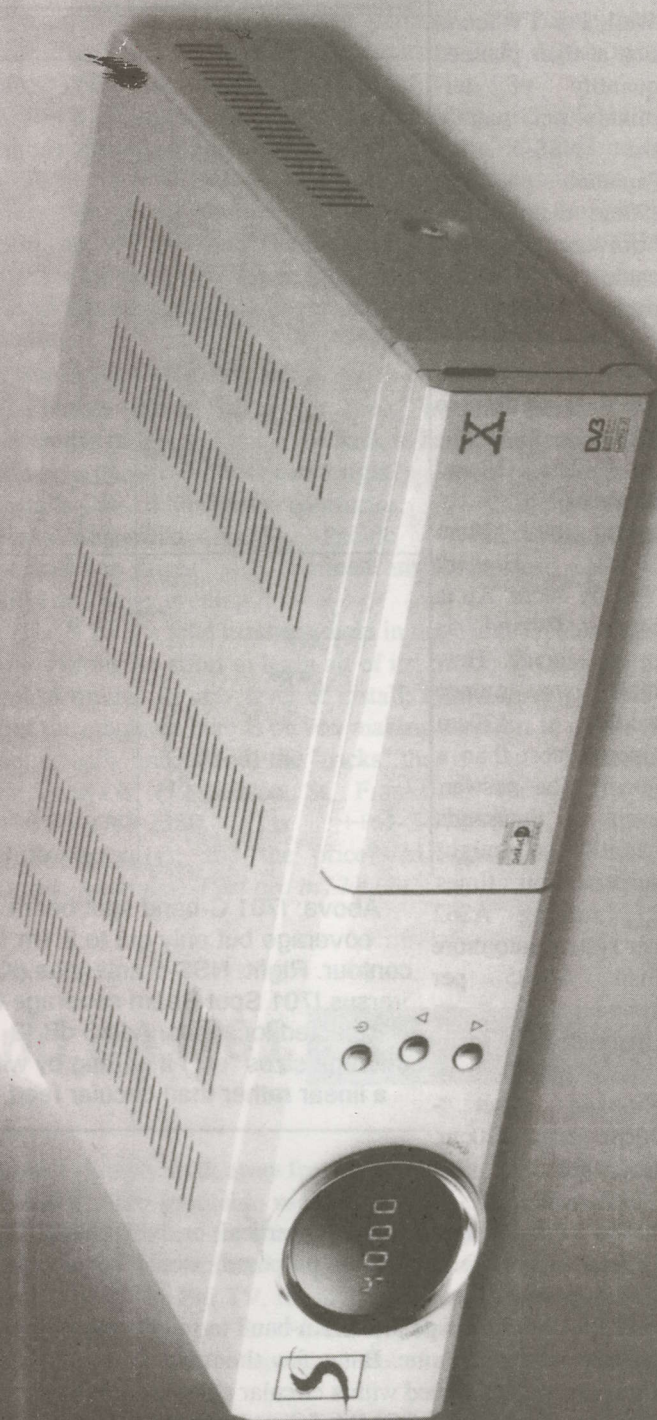
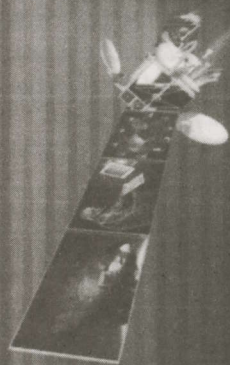
TOTAL: 40.56 Mbps (13 TV channels + 10 Radio)

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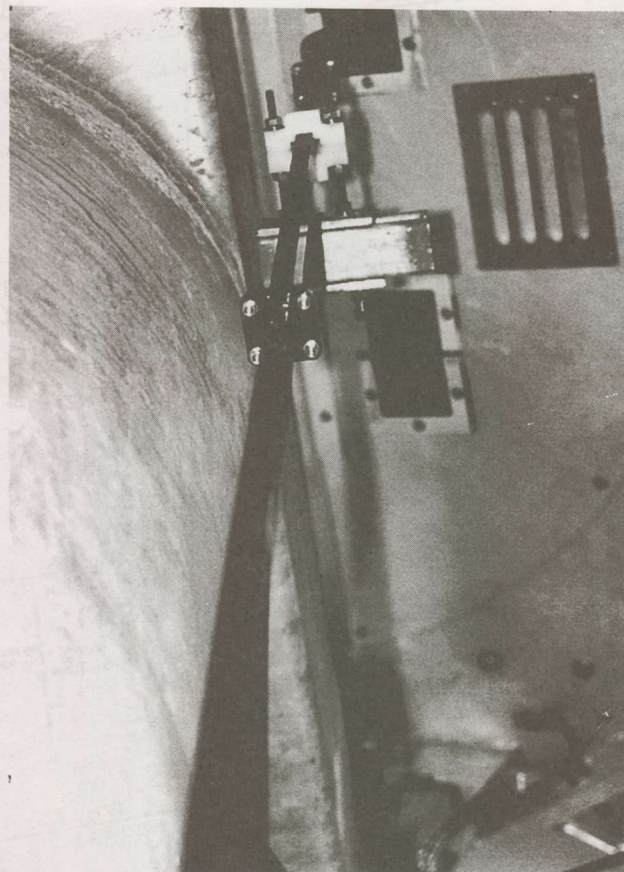
Intelsat I701 C-band
coverage for Fiji TV.

Intelsat (and a few older Russian bird) users need them at C-band - which keeps the volume low and the prices up.

And then there is the matter of the mount. A 90cm Ku dish can go on a "Universal mount" which in Fiji TV's volume costs around A\$18 each. A 120cm prime focus (C-band) dish requires a much more substantial mount - and in a cyclone area such as Fiji, the recommendation is for a thick-wall steel pipe, protected against rust, either attached firmly to a concrete block or poured (concrete) wall with a special mount, or, as would be the most common case, on a 60+mm thick wall pole installed in a hole dug in the ground, filled with Sakrete or concrete. Neither the special "heavy-duty" side (or roof) mount nor the in-a-hole ground mount are going to be done for A\$18 each.

Add all of these up. For Fiji TV, C-band spot beam is going to cost more than twice as much, per terminal, even within their +38.5 dBw boresight region, than Ku band. Multiply perhaps an additional A\$100 per terminal times 20,000 terminals over 5 years and - A\$2,000,000 more spent to equip subscriber terminals. It is enough - by a big margin - to stop Fiji TV before it starts.

NSS/Intelsat claim C-band costs no more than Ku. A SatFACTS study says they are wrong. With 18 Intelsat birds operating more than 300 transponders and 1,500 programming channels, only one (an Argentina service, named Alef), uses a C-band spot beam. For now, Fiji TV continues the "negotiations" under a direct order from the Dutch Appeals Court (which said late in October - "Don't come back to us until you have exhausted all direct negotiation possibilities"). As this issue of SatFACTS goes to press, there is NO decision. For Fiji TV to accept C-band, NSS must somehow find a solution to the additional costs Fiji TV will pay to be on C-band circular polarisation. Stay tuned!



TRANSMITTER bay for 14GHz at Fiji-TV would require replacement with 6 GHz uplink system, including 6GHz for 14 GHz uplink "waveguide," connecting transmitter to dish "feed."

Coping with and fixing UNwired TI

Part One: Garry Cratt's 3.5 GHz Terrestrial Interference "Cookbook"

In October 2000, the Australian Communications Authority (ACA) sold off part of the 3.4GHz spectrum to three companies, raising more than \$112 million. In doing so, they set in stone a progressive rollout of a huge fixed wireless network to carry broadband Internet services in all populated areas of Australia, which ultimately may disrupt the reception of up to 100,000 C band satellite viewers across the country.

The ACA had, some time earlier, devised three bands within what they term 3.4GHz spectrum. These three bands cover 3.425GHz to 3.575GHz, despite the fact that international satellites such as ApStar 2R, Thaicom 3, InSat and Palapa C2 were delivering signals into Australia on the same frequencies.

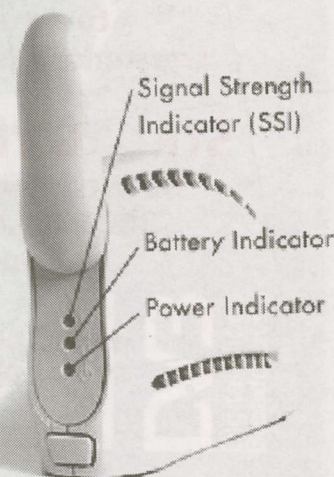
In the roll out prior to the commencement of service in August 2004, hundreds of sites had been equipped with terrestrial transmitters to ensure saturation coverage of Sydney (Melbourne is next - soon!).

Because these sites rely on microwave or fibre optic connectivity, they have been installed at many GSM towers and two way radio communication sites where these facilities already exist. In addition, high-rise buildings have been used to ensure optimum coverage. This is all very well for wireless

Internet users, who can now experience the benefits of broadband-like Internet speed without connection to a wired service provider, but for C band satellite viewers in Sydney, a blank TV screen was the result.

Analysing the problem revealed that the most prolific operator is "UNwired Australia," whose wholly owned subsidiary, AKL, has paid \$95 million for licenses in all areas where the spectrum has been made available.

The company claims to own close to 100% of the 100 MHz spectrum that was made available in Sydney and Melbourne, and the majority of the spectrum in Australia's other capital cities.



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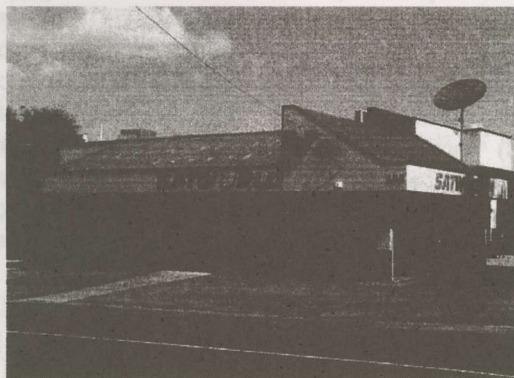
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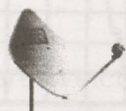
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They utilise the combination of wireless broadband product from US supplier, Navini Networks, backhaul equipment to Airspan Networks, Network operation services from Ericsson Australia Ltd, router and IP switching equipment from Cisco Systems, and fibre connectivity from Ucomm.

The network uses the 802.16e protocol, a proprietary type of WIMAX technology, yet to be ratified by the IEEE. The map of Sydney shows the wide (area) coverage of the system. UNwired have licenses allowing them to operate at all sites until December 13 (2015). So the problem is here to stay.

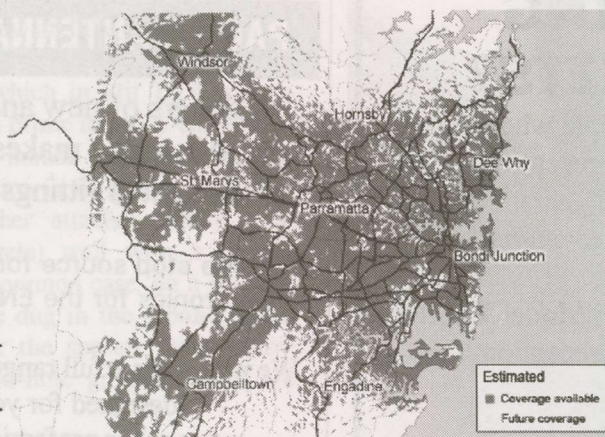
The ACA have a website (www.aca.gov.au) which contains a comprehensive list of transmitter sites, power levels, frequencies and radiation patterns, so it is possible to research the probability of interference by location. The map (on close inspection) indicates there are at least 196 separate transmitters (serving the Sydney CBD), operating from 68 sites licensed to operate in Sydney. The company is targeting the potential market of 3.5 million people in 1.2m households, and 240,000 small businesses in Sydney. UNwired's own website states that users are able "to connect within a range of up to 10km from a tower." That same 10 km radius also represents a "zone of C band interference."

Not only is interference generated by UNwired towers, but the wireless modem ("transceivers" - illustration, p. 18) supplied to consumers also operates at C band frequencies. This means that wireless broadband users located in a very close proximity to a C band satellite service can also generate interference anywhere within the allocated bands.

The downlink remedy

The obvious problem of operating a terrestrial transmitter on exactly the same frequency as a satellite signal means satellite reception is simply not possible. Even operating at a power level of a few watts, the terrestrial signal obliterates a satellite signal of a few pico watts. Satellite systems are designed, by necessity, to receive very weak signals and as a part of this design, the amplifiers (LNBs) used cannot tolerate having a huge signal forced down the input port ... *death by overload!*

In a case of severe interference the presence of a huge signal on a frequency within the passband of the LNB (such as the expanded 3.4>4.2GHz products) means the LNB is severely overloaded, sometimes driven into compression (a state which causes the amplifier to turn into a "mixer" adding



the unwanted signal content to the desired signal content, totally destroying the BER - Bit Error Rate - of the desired signal). This results in distortion of the amplifier section of the LNB(f). The amplifier, after reaching "compression," produces

a range of signals in addition to the desired one from the satellite, which become mixed with the local oscillator (typically 5.150GHz) producing a huge, broad output up to 500 MHz in width, totally destroying *all* of the desired signal(s).

In some cases of mild interference, moving the dish to a location shielded from the source of terrestrial interference may help. In all cases, changing the LNB(f) from one covering 3.4>4.2GHz (extended C band) to

one covering 3.7>4.2GHz (the original C-band) will help. The next most positive effect comes from ensuring the installation uses a quad-shield RG-6/U and compression type sealed F connectors.

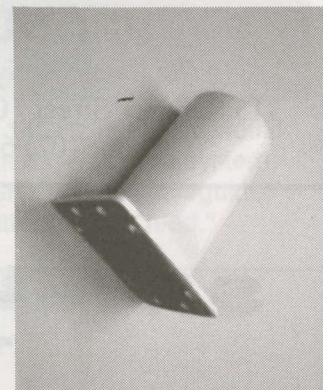
In more severe cases of interference, changing the LNB(f) to 3.7>4.2 may not cure the problem. The next step is to replace the LNB with a single polarity type and simultaneously change the feed to a single polarisation type. Yes, this "fix" will mean that one polarity (typically vertical) will no longer be available (the vertical polarisation of the UNwired interference becomes 20 to 30 dB "less" when you are cross-pole to the interference).

After this step, the next is to upgrade to a special LNB(f) design identified with the letters "PLL" (phase locked loop) and then adding a waveguide filter (MFC et al). These two steps greatly reduce the interference levels from below 3.7 GHz.

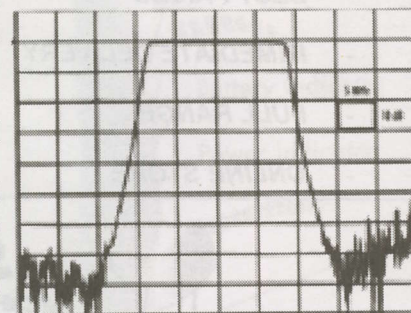
For satellite systems where the user requires both polarities, an orthomode coupler feed is required equipped with a pair of PLL LNBs and a pair of waveguide filters. This would be the "ultimate fix" but fortunately the high costs involved and full-time access to both polarities simultaneously applies primarily to folks such as Globecast. The waveguide filters have a definite "in" and "out" end and the "in" goes towards the feed while the "out" goes to the PLL LNB. A waveguide filter installed "backwards" does nothing to justify its high price tag!

Solution two - the IF remedy

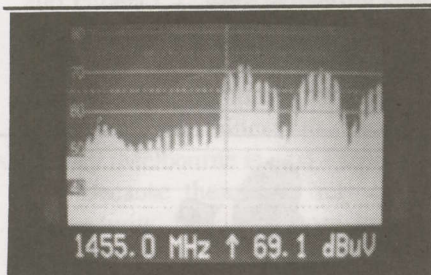
While the best (and often only) remedy is to remove the interference before it enters the LNB input, some relief from the effects of mild interference may be



Single pole feed horn



Typical Response Curve of 7892D
Waveguide filter response



Overload drives LNB into compression (Sky Ch, Aust)

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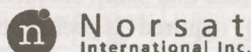
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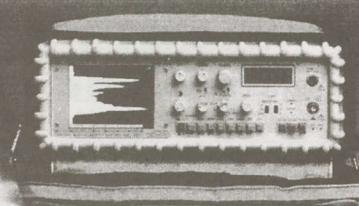
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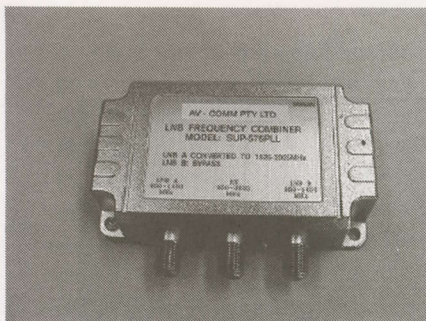
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Dual input "combiner" as filter

realised by "conditioning" the signal after the LNB and before the receiver.

A satellite receiver is designed to accept a 500-1,200 MHz wide band of input signals (950-1450; 950-2150), and as such, does not have

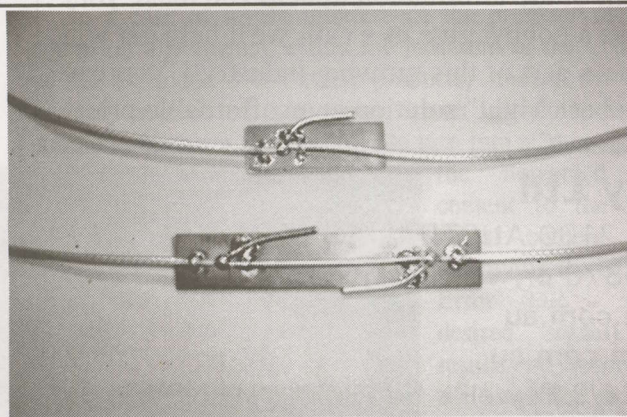
the selectivity required for more severe interference.

Feeding a high level signal, through the LNB(f) to the receiver, can cause the receiver's tuner to be "overdriven." In some cases of mild interference, an improvement may be obtained through the simplistic use of a 10 dB attenuator installed at the input of the receiver (it must be capable of power passing). As well as reducing the satellite signal, the attenuator "deafens" the IRD tuner to some degree, reducing the total amount of input signal and thereby allowing the tuner to operate more normally.

Where the interfering signal is converted by the LNB(f) along with the satellite signal(s), it will appear as an IF (L-band) signal, normally just outside the nominal 950 - 1450 MHz IF band generated by the 3.7 - 4.2 GHz LNB(f). An IF filter centred on the interfering (L band) frequency can be used to some advantage without adversely affecting the satellite signal(s). Such filters operating within L-band are inserted into the coaxial line at the receiver end, configured to pass the DC voltage the LNB requires.

A dual band combiner also has filtering properties that can be used to advantage. Designed to accept signals from two dishes, these combiners have a high level of filtering to ensure the two IF blocks are separated. This means the 950 - 1450 MHz section is well filtered from the adjacent 1500/1650 - 2000/2150 MHz block of output signals. Thus, an interfering signal from UNwired at 3.55 GHz, which will appear at L band IF of 1600 MHz, is greatly reduced on the "bypass" port (950 - 1450 MHz).

A relatively simple IF filter can be constructed to reduce the effects of an interfering signal. By connecting a quarter-wave (length) open circuit "stub" (tuned to frequency) to the coaxial cable feeding the receiver, up to 25 dB of unwanted UNwired rejection can be obtained. Construct two of these filters and place them a half wavelength apart which will



Inline L-band 1/4 and 1/2 wave stub filters hold promise of being low cost but setup is tedious.

create up to 70 dB of rejection as a pair. Unfortunately, whilst the mechanical construction of the filter is straight forward, measuring the frequency to which it is tuned requires a L band signal generator and spectrum analyser capable of operating from 1400 - 2000 MHz (1.4 to 2.0GHz). There simplistic stub filters (Editor: actually - traps) have a drawback as well. They can only achieve 10 dB of signal rejection for every 10 MHz of bandwidth between its' design frequency and the nearest satellite signal frequency. An UNwired signal 70 MHz removed from the desired C-band signal will, at best, be 7 x 10dB or 70 dB attenuation. If the satellite signal is say 50 dB removed, there will be loss at the satellite frequency as well.

And the stub length is critical; a change in length of 1mm (consider how small that is!) results in a shift in the centre frequency of 100MHz; obviously not a game for careless designers. It is also possible to create elaborate "cavity filters" which offer narrow bandwidth and sharp frequency response, but the effort (and cost) required is better translated to spending more money on a more bullet-proof LNB.

Finally there is the receiver proper. Experience in Sydney shows there is a very significant difference in the performance of tuners in the many various IRDs available. Generally, it is accurate to say the cheaper the satellite receiver, the poorer the results in areas of even mild UNwired interference.

Not to be overlooked

And the cabling and connectors. You might suspect these factors would not be involved in interference suppression; experience dictates otherwise. In cases of high level interference where the UNwired energy drives the LNB into compression, it has been observed UNwired will enter the coaxial cable (LNB to receiver) directly penetrating the shield on the cable and coupling into the centre conductor (a case of less than adequate wrap-around shielding on the cable). There are solutions:

1/ Reinstall the vertical runs of RG6 inside of metal conduit. The combination of a vertical run (matching the polarity of the UNwired signals) and less than 100% shielding will be corrected by the extra shielding of the conduit.

If waveguide filter (such as from Microwave Filter Company) has already been installed and the interference persists, it is a case of direct pickup by the RG6 downline. The filter helped but it did not eliminate the segment of UNwired signal caught by the less than adequately shielded downline.

2/ As a temporary "test," wrap the vertical section of the downline in common aluminium foil - yes, it will enhance the shielding characteristics.

Crimp-on F connectors (in particular the kind that crimp to a "star" as opposed to those that crimp to a "funnel" shape) can create ingress (UNwired signals leaking into the cable). The four-five-six points of bonding between the "star shaped" or "hex" crimp only makes "bonding contact" with the shield of the cable at a limited number of points. The solution here is to use only full compression F connectors installed with a mating crimping tool.

Ahead

Part two (SF#124; December) will look at practical solutions to this problem.

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 NOV, 2004

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym
Thom3/78.5	SkyChAust	3695/1455H	up to 3	3/4	5(,000)
	ANT Greece	3672/1478H	1 TV	3/4	13(,333)
	Korean Central	3665/1485H	1	2/3	3(,367)
	TARBS ME mux	3640/1510H	12TV, 12 radio	2/3	28(,066)
	Ch Nepal	3626/1524V	1	3/4	15(,556)
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(,667)
	SE asia Mux	3569/1581H	2+ TV	3/4	12(,500)
	RR Sat mux	3551/1600H	8TV, 10 radio	3/4	13(,333)
	JAIN TV	3538/1612V	1TV	3/4	3(,300)
	PTV1 +	3521/1629V	1TV, 1 radio	3/4	3(,333)
	FTA Mux	3520/1630H	12TV, 12 radio	3/4	29(,800)
	KTN plus	3500/1650H	2+ TV	3/4	26(,667)
	TVK Cambodia	3448/1702H	1TV	1/2	6(,312)
	TARBS/Th5	3480/1670H	12 TV+radio	2/3	26(,667)
	KCTV/Korea	3424/1726H	1TV	3/4	3(,366)
InSat 2E/83	Thai Global	3425/1725V	up to 79	2/3	27(,500)
	ETV mux	4005/1145V	6+ TV	3/4	27(,000)
	Hyd Dig 2E	3910/1240V	1	3/4	5(,000)
	Kairali TV	3699/1451V	1	3/4	3(,184)
	Indian mux	3643/1507V	3	3/4	19(,531)
NSS6/95E	ETV Mux#2	3485/1665V	4+TV	3/4	27(,000)
	Sky Bangla	3430/1720V	1TV	3/4	6(,000)
	Ant Pac (Greek)	11.083H-Australia	1 TV	3/4	2(,171)
	TVR Int	11.106H-Australia	1TV	3/4	3(,255)
	Guangdong TV	4075/1075H	1TV + radio	3/4	6(,000)
As2/100.5E	Euro Bougt	4000/1150H	6TV, 21r	3/4	28(,125)
	Reuters News	3905/1245H	1TV	3/4	4(,000)
	WorldNet	3880/1270H	4+28radio	1/2	20(,400)
	APTN Asia	3799/1351H	1	3/4	5(,632)
	Reuters/Sing.	3775/1375H	1	3/4	5(,631)
As2/100.5E	Macau MUX	4148/1002V	5TV	3/4	11(,850)
	Feeds	4086/1064V	1	3/4	5(,632)
	Dubai MUX	4020/11430V	4+, radio	3/4	27(,500)
	Fashion TV	3795/1355V	1	3/4	2(,626)
	3-ch miniMUX	3752/1398V	up to 3	3/4	5(,640)
As3S/105.5E	Saudi TV1	3660/1490V	7+tests	3/4	27(,500)
	Telstra I-Net	12.596V	no TV	5/6	30(,000)
	RR Mux	3669/1481V	up to 5 TV	3/4	13(,333)
	Zee bouquet	3700/1450V	10TV	3/4	27(,500)
	Ch News Asia	3706/1444H	1TV (+)	3/4	6(,000)
As3S/105.5E	BTV World	3725/1425V	1TV	3/4	4(,450)
	SAB TV	3743/2407V	1TV	3/4	3(,300)
	Ariwang TV	3755/1395V	1	7/8	4(,418)
	New TV +	3760/1390H	up to 8TV	7/8	26(,000)
	Star TV	3780/1370V	7(+TV)	3/4	28(,100)
As3S/105.5E	GXTV	3806/1344V	1TV + 3 radio	3/4	4(,420)
	Shaanxi TV	3813/1337V	1TV + 2 radio	3/4	4(,420)
	Anhui TV	3820/1330V	1TV + 2 radio	3/4	4(,420)
	Jiangsu TV	3827/1330V	1TV + 2 radio	3/4	4(,420)
	HLITV	3834/1316V	1TV	3/4	4(,420)
As3S/105.5E	Star TV	3840/1310H	7(+TV)	7/8	26(,850)
	Star TV	3860/1290V	5(+TV)	3/4	27(,500)
	Abu Dhabi MUX	3880/1270H	8+TV, 10Radio	3/4	27(,500)
	Dragon TV	3886/1264V	1 TV	3/4	4(,800)
	Shaanxi TV	3895/1255V	1TV + 6 radio	3/4	6(,813)
As3S/105.5E	Jilin TV	3914/1236V	1TV + 1 radio	3/4	4(,420)
	Star TV	3920/1230H	4+ TV	7/8	26(,850)
	Star TV	3940/1210V	6(+TV)	7/8	26(,850)
	CNNI	3960/1190H	8(+TV)	3/4	27(,500)
	Star TV	3980/1170V	6+TV	3/4	28(,100)
As3S/105.5E	Star TV	4000/1150H	8(+TV)	7/8	26(,850)
	Sahara digital	4020/1130V	8TV	3/4	27(,250)
	Hubei TV	4035/1115H	1TV + 2 radio	3/4	4(,420)
	Sichuan TV	4051/1099H	1TV + 1 radio	3/4	4(,420)
	Qinghai TV	4067/1083H	1TV + 2 radio	3/4	4(,420)
As3S/105.5E	Hunan TV	4082/1068H	1TV + 1 radio	3/4	4(,420)
	Pakistani TV	4091/1059V	5TV, 1 radio	3/4	13(,333)
	Sun TV	4095/1055H	1	3/4	5(,554)
	TVB8 Mux	4110/1040H	3	3/4	13(,650)
	Indus News	4115/1035V	1	3/4	3(,222)
As3S/105.5E	CCTV bqt	4129/1021H	4(+TV)	3/4	13(,240)
	Zee Bqt #2	4140/1010V	8(+TV)	3/4	27(,500)
	Henan TV	4166/984V	1TV + 4 radio	3/4	4(,420)
	Fujian TV	4180/970V	1TV + 2 radio	3/4	4(,420)
	Jiangxi TV	4187/963V	1TV + 2 radio	3/4	4(,420)
As3S/105.5E	Liaoning TV	4194/956V	1TV + 2 radio	3/4	4(,420)
	Indovision (S-band)	2.535, 2.565, 2.595, 2.625, 2.655	33(+TV)	7/8	20(,000)
T'Kom/108E	IndoBqt	3460/1690H	up to 6	3/4	28(,000)
	TPI	4185/965V	1	3/4	6(,700)
	TVE Asia-Africa	4160/990H	1	3/4	5(,632)
	Anteve	4144/1006V	1	3/4	6(,510)
	Kabelvision Mux	4080/1070H	7+ TV	7/8	28(,125)
C2M/113E	Indostar	4074/1076V	1	3/4	6(,500)
	Satelindo	3935/1215H	1	3/4	6(,700)
	Bali TV	3926/1224H	1	3/4	4(,208)
	Indo MUX	3880/1270H	3+ TV	7/8	28(,121)
	Global MUX	3760/1390H	up to 11 TV?	7/8	28(,121)

Receivers and Errata

CA (#1, 3); FTA audio #2 (dm)
Late July 04: room for more (FTA)
Global footprint; changes 02/03.
CA + 2 FTA(A1TV, IRB3)
New 03/03; FTA
Thai + Indian services; FTA
MRTV3, MRTV (DM)
3TV, 5radio inc. Hellas TV Greece FTA
PIDs 4132/4133
frequency change
Aug 04: 5TV, 1 ra FTA (India)
Irdeto 2, apparently SE Asia based (08-04)
FTA
3FTA: TV5, VTV4, ATN Bangla
Not 24 hour; FTA?
FTA (reaches SE Australia)
Several ETV now here; wide beam
SCPC, OK E. Aust. wide beam
SCPC, OK E. Aust wide beam
corrections 12/02
Several new ETV here; Asia beam
New - November 2002
(still) FTA 09-04
(still) FTA 09-04
July 04: FTA
FTA TV + radio; TV5 Asia moved "down" April
Was 3923H; sometimes FTA
FTA; multiple audio services V2360, A2320
Sometimes FTA; also 3895Vt
FTA & CA
5 chs TV, FTA, some tests
FTA SCPC feeds
FTA, EuroSport PID change (1213/1313) June
FTA as of May 1, 2003
Sun-TV, Surya TV, KTV (FTA)
FTA MCPC; Yemen, MBC EUROsport tests
Signal useful for dish testing - no TV
Bluekiss adult here; CA cards sales@bluekiss.biz
Now SECA 2 CA (10-04)
New September 2003; English + V1160, A1120
Bangladesh TV FTA started early March 2004
FTA SCPC; New PIDs V3601, A3606 June 2003
CA + NOW, Bberg, Indus Music, MTA FTA
NDS CA (Pace DVS211, Zenith)
Guangxi TV; was As2
Was As2
Was As2
Was As2
Was As2; HeiLong
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
New April 2004: link to Optus B3 Globecast
Shanghai
Apparently Mongolia; was As2
Was As2
Star Sports Asia (+), FTA NTSC; V514, A670 (10-04)
NDS CA as above; may NOT be operational
PowVu CA; new SR Apr 29; CNN radio FTA
NDS CA; Star News India FTA VPID 514, APID 648
NDS CA w/ 4(Chinese) FTA
New Sr September
Was As2
Was As2
Was As2
Was As2
new Sr, channels, Nov 2003
"History Channel" - SCPC
MATV Chinese movies FTA +CA; new Sr 05-04
Hindi (+ "Plus")
moved from 4115
Now SECA 2 CA (10-04); 1 occ. FTA (varies)
Was As2
Was As2
Was As2
Was As2
NDS CA using RCA/Thomson,
Pace IRDs; 2.535 has 2 FTA
also 3586H/17.500, 3496H/19.615
FTA SCPC; NT/NC only
New August 2003
change from 4055V; FTA SCPC
also try 3500H, 27.000, 3/4; strong NZ
FTA (new 06-03); V2201, A2202
test card - only - reported
FTA, may not be active full time
FTA; Sr change 01/03; erratic
frequent changes; often only test cards

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
	Brunel/Sing	3733/1417H	1TV	3/4	6(,000)
	SCTV	3726/1424V	1TV	3/4	6(,620)
	RCTI	3473/1677H	2	3/4	8(,000)
As4/122E	Aust DTH test	12.427V	2	3/4 (?)	20(,000)
	CCTV internal	4020/1130V	6	3/4	27(,500)
	CCTV internal	4100/1050V	6	3/4	27(,500)
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(,000)
	Asian bqt	3960/1190V	up to 8	7/8	30(,000)
ApS138	Tests	3866/1284H	1		3(,355)
Jc2A 154	BYU-TV	3915/1245V	1+languages	3/4	4(,166)
MeasSs2	Astro Mux	11.602H	up to 17TV	3/4	41(,500)
	VTM MUX	11.522V	3 TV	3/4	9(,766)
B3/152	AuroraBiz	12.407V	4 TV, 10 radio	2/3	30(,000)
	Occ feeds	12.442H	1TV	3/4	6(,666)
	GlobeCast 2	12.525V	13 TV, 8 radio	2/3	30(,000)
	GlobeCast (feeds)	12.550-555V	1TV	3/4 & 2/3	6(,110/670)
	UBI/tests	12.613H/T14L	11+TV	3/4	22(,500)
	UBI/tests	12.649H/T14U	11+TV	3/4	22(,500)
	GlobeCast 1	12.658V/T7	14TV, 15 radio	2/3	30(,000)
	UBI/tests	12.674H/T15L	11+TV	3/4	22(,500)
	UBI/tests	12.701H/T15U	11+TV	3/4	22(,500)
	WA ABC	12.702V	1 TV, 1 radio	7/8	14(,288)
	WA SBS	12.720V	4TV, 2 radio	5/6	12(,600)
	WA GWN/WIN	12.738V	2TV	7/8	14(,295)
C1/156E	Optus test bed	12.324V/1U	(empty)	1/2 (*)	24(,450*)
	Pay TV	12.365V/T2	11TV, 2 radio	3/4	27(,800)
	Aurora Home	12.407V/T3	5 TV, 13 radio	2/3	30(,000)
	Pay-TV	12.447V/T4	5TV, 4 data	3/4	27(,800)
	Pay TV (test)	12.487V/T5	3 TV	3/4	27(,800)
	Aurora 2	12.527V/T6	7TV, 20 radio	3/4	30(,000)
	Pay-TV	12.567V/T7	10 TV	3/4	27(,800)
	Pay-TV	12.607V/T8	10 TV	3/4	27(,800)
	Pay-TV	12.647V/T9	10 TV	3/4	27(,800)
	Aurora 3	12.720V/T10	6TV, 16 radio	3/4	30(,000)
	Austar	12.305H/T11	6TV, 24 data	3/4	30(,000)
	Pay-TV	12.358H/T12	10 TV	3/4	27(,800)
	Pay-TV	12.398H/T13	10 TV	3/4	27(,800)
	Pay-TV	12.438H/T14	6TV, 3 data	3/4	27(,800)
	Pay-TV	12.478H/T15	10 TV	3/4	27(,800)
	Pay-TV	12.518H/T16	10 TV	3/4	27(,800)
	Pay-TV	12.558H/T17	10 TV	3/4	27(,800)
	Pay-TV	12.598H/T18	TV	3/4	27(,800)
	Pay-TV	12.638H/T19	10TV, 30 radio	3/4	27(,800)
	Pay TV	12.688H/T20	11TV	3/4	27(,800)
B1/160	Net Ten	12.353H	1TV	3/4	5(,100)
	Occ. feeds	12.380H	1 TV - *	3/4	6(,111)
	Occ. feeds	12.384V	1 TV - *	3/4	6(,111)
	Net 7 service	12.397H	1	3/4	7(,200)
	Imparja mx	12.379H	2TV + 8 radio	3/4	5(,424)
	7 digital feeds	12.397H	1TV	3/4	7(,200)
	Feeds to NZ	12.411V	1 TV	3/4	6(,111)
	SBS Mux	12.420H	3+ TV, 2+ radio	5/6	12(,600)
	TVNZ DTH	12.456V	5+TV	3/4	22(,500)
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(,500)
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(,500)
	Sky NZ	12.644/671V	9TV	3/4	22(,500)
	ABC HDTV	12.610H	5TV	7/8	14(,3288)
	Sky NZ	12.707/734V	8+TV	3/4	22(,500)
	Mix 106.3	12.574H	1 radio + data	3/4	1(,851)
P8/169	ABS-CBN	12.575H	4+TV, 4+ radio	2/3	13(,845)
	JEDI/TVB	12.686H	11+ TV	3/4	28(,126)
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(,500)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(,125)
	Taiwanese MUX	4080/1070H	12+ TV	5/6	30(,000)
	NHK Joho	4060/1090H	7TV, 1 radio	3/4	26(,470)
	FOX Mux	4040/1110V	up to 5TV	7/8	26(,470)
	NET+	4121/1029V	1 TV	3/4	4(,774)
	ESPN USA	4020/1130H	8+TV, data	3/4	26(,470)
	Discovery	3980/1170H	8 typ.	3/4	27(,690)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(,690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(,500)
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(,694)
	TaiwanBqt	3860/1290H	12TV + 30 r	5/6	28(,000)
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(,240)
	TVBS-N	3836/1314V	1FTA, 4+ CA	3/4	22(,000)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(,632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(,000)
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(,850)
	MTV	3740/1410H	8	2/3	27(,500)
P2/169E	WA Mux Pv	12.281V	3+ TV, radio	2/3	27(,500)
	Arfang TV	12.401V	1TV	3/4	4(,400)
	ABS-CBN	12.575H	4TV, 2 radio		13(,845)
	NBN	4126/1024V	1TV	3/4	3(,075)
	TARBS feeds	4090V/1060V	9TV + radio	3/4	21(,000)
	Feeds	4027/1123H	1+TV	2/3	6(,620)
	Middle East	3836/1314V	4 typ	3/4	13(,331)
	Feeds	3803/1347V	1	3/4	6(,000)
	PAS/BBC mux	3744/1406V	3	3/4	21(,500)

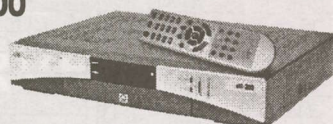
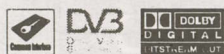
Receivers and Errata

FTA ; Singapore 23hrs, Brunei 1 hr, Brunei V1200
was on 4048V; New Caledonia, parts of Australia
FTA SCPC; Australia, New Caledonia, some English
Planned Aust DTH; VTV CA, other FTA (10-04)

New Aug '04; Irdeto 2

New Aug '04; Irdeto 2 + TVSN occ. FTA
PowerVu; some FTA (Ch. 1 & 3)
CA & FTA NTSC: Japan, Taiwan
3759/Sr24.843; 3786/Sr5.000; 3846H/Sr4.292 (NZ)
Erratic service; strong NZ & Australia
Aust East beam - 3 FTA + 14 CA
WA only? Skew path, intended Asia
differs from 12.407 C1; **tune ch FTA; NZ+Au**
Net 10, V8 racing; also 12.452H, same parameters
NZ + Au, FTA, Mrcrypt CA
occ feeds, NZ + Au
High performance beam; not NZ
High performance beam; not NZ
NZ + Au (Mrcrypt, PowVu capable)
High performance beam; not NZ
High performance beam; not NZ
ABC WA tests, FTA
SBS, radio tests WA FTA
Irdeto V2 CA, tests (GWN, WIN)
new #s 11-04; *may be temporary numbers
Tests; SBS-NDS CA, others FTA when here
NZ (90cm) + Australia (**Only svc left on NZ; C1**)
Australia NA only (leakage to Norfolk, New Cal)
Australia NA only (leakage); 9-Net x 3 widescreen
Arrow radio, tone FTA
Pay-per-view movies; CA
Pay-per-view movies; CA
Pay-per-view movies; CA
Pay TV
Austar inter, Expo FTA
NDS CA + Mrcrypt; CA
CA, subscriptions available Australia, Norfolk
Sky News active; "Help" FTA
CA, subscriptions avail Au, Nrlk; **TVSN FTA**
CA, subscriptions available Australia, Norfolk
"Home" CA, subscription available Australia, Nrlk
CA, subscriptions avail Australia, Norfolk
CA, subscription available Australia, Norfolk
CA, subscription available Australia, Norfolk
Central beam; terrestrial station links
* - plus 12.451H, 12.460H
* - plus 12.293V, 12.402V, 12.411V
Full schedule less commercials - links; may be CA
PIDs vary; also try 12.360, 12.370
occ. digital feeds; typ fla
Often NTSC; USA-Australia-NZ
Also 12.437H same params; SBS HDTV + w-s
FTA 4 channels (TVNZ x 4); +Maori here
NDS CA, subscription available NZ
NDS CA, subscription available NZ
NDS CA, subscription available NZ
also see 12.626, 643, 670, 688, & 706H
NDS CA, subscriptions available NZ
Radio SCPC is "cover" for high speed data
FTA, plans CA "soon"
June 2002-Irdeto-2 CA
Dateline west; also east PAS2, 3901V
PowVu CA
Tests - CA service announced
PowVu CA & FTA; subscription available
was PAS-2, previously 3992Vt; **feeds FTA**
NET25 + FTA; new PIDS April '03; reload
PowVu CA; ch 11 DCP-CCP bootload; audio FTA
PowVu/CA (some audio FTA)
PowVu CA & FTA (EWITN + CBS +)
NDS CA (6 channels); one test card occ FTA
Myx FTA V1960, A1920 + radio FTA
Mixed FTA & CA; STC gone (CA)
PowVu FTA, replaces PAS-2 svc
Difficult because of CCTV cross pole
was As2; PowVu CA
PowerVu; some audio FTA
PowerVu; Asian MUX; new parameters Nov '03
8 **MTV China FTA V289, A290**; rest CA
PowVu CA, WIN, ABC NT, SBS; status unknown
Test - may not stay permanently
Temp FTA; will be CA, subs 011-800-2270-0722
May not be permanent; not available to NZ
Occ FTA (Chile +); BIG power reduction Nov 03
Sporting feeds from USA (occasional)
Irdeto 2 CA - subscriptions avail; Strong Tech
PowVu (FTA) occ sport feeds inc. Japan BB
BBC, test card FTA, others nominally CA

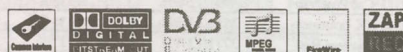
homecast eM200



Digital Satellite Receiver with 2 x CI slots.
and Irdeto 2.09 CI cam.

SATELLITE

homecast eM320PVR



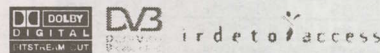
Satellite Receiver with Dual Tuner, firewire,
and 44 hours recording with Irdeto 2.09 CI cam.

homecast eM300PVR

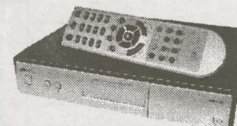


Satellite Receiver with CI slots & 22 hours
recording with Irdeto 2.09 CI cam.

homecast eM150IR



Compact embedded Irdeto
Satellite receiver with 1 card slot.

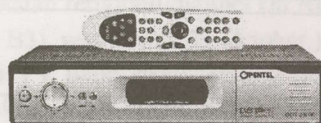


All the above receivers are suitable for receiving the Irdeto encrypted KU
programming from **NSS6 satellite** with the appropriate authorized smart card.

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ODT3000F

Standard definition,
High quality. Full
Featured including, RF modulator, S-Video
out, Wide button, 8 favourite groups, SPDIF
out, Competitive pricing.



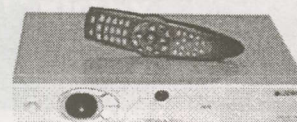
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80G PVR with Twin Tuners!

SD with 40 hours recording.
Record one channel while
Watching another, Play a recording while recording
a channel, 4 week event timer, 8 favourite groups,
trick play forward & backward 1/2x, 2x, 4x, 8x & 16x
speeds, Mark A&B points on your recording, Jump
to any point in your recording. **Order Now!**

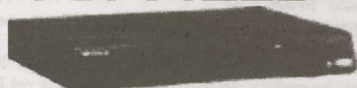


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Phone # +65 6332 2273
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Email sales@wavelength.com.sg
Website www.satellite.com.sg

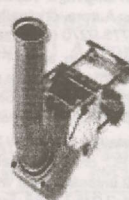
TOPFIELD



TF3030F (FTA)
TF3000CIpro (Common Interface)
TF3000CIPpro (Common Interface
with Built-in Positioner)
TF3200IR (Irdeto embedded)
TF4000PVR (Personal Video Recorder 40GB)
TF5000PVR (PVR 80G)

SUPERJACK

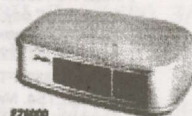
Positioner



DG-120
DiSEqC H-H
Mount



Actuator
12" to 36"

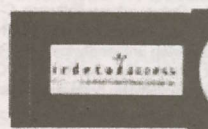


EZ-2000
EZ-4000
EZ-6000
VBOX II DiSEqC 1.2

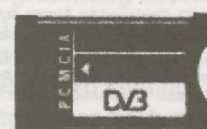
MAXPLUS HTS 9300 +

Single slot card reader (Viaccess, Irdeto, Conax)
4000 channel capacity
8-event timer
4 sorting modes
Software upgrading

CI Module



Irdeto 2.09 cams



Viaccess 2.5 cams

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	Adventists.tv	4040/1010H	1	2/3	5(.900)
	Feeds	3868/1182H	1	2/3	6(.620)
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)
	HK bouquet	3850/1300H	up to 8	2/3	24(.900)
	Korean Bgt	3771/1379H	1	3/4	9(.041)
1804/174E	iPSTAR	12.619H	1	2/3	25(.220)
	Tests-NZ beam	12.646H	1	3/4	22(.418)
	RFO Poly	4027/1123R	1TV	3/4	4(.566)
1701/180E	TNTV	11.060&11.514V	9	3/4	30(.000)
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)
	PBS	12.726(8)H	16TV possible	3/4	28(.066)
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)
	TVNZ	4178/972RHC	1	3/4	5(.632)
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(.680)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)
	RFO-Canal+	4086/1064L	4TV, radio	5/6	12(.041)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)
	TVNZ feeds	4044/1106R	1	3/4	5(.632)
	NZ Prime TV	4024/1126L	1	2/3	6(.876)
	NBC to 7 Oz	3960/1190R	1	7/8	6(.447)
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(.000)
	Ioarana	3772/1378L	1	3/4	4(.566)
	NASA TV	3854/1296R	1 TV	3/4	2(.000)
	TVNZ	3846/1304R	1	3/4	5(.632)
	NBA (Barker) Ch	3803/1347R	1	3/4	6(.111)
	10 Australia	3769/1381R	4	7/8	20(.000)
	USA feeds	3749/1401R	4?	?	26(.400)
NSS-5/177W	Pacific IP Data	3745/1405R	none-date	3/4	44(.995)
	iPSTAR Tests	12.691V	8+ TV	5/6	17(.600)

Receivers and Errata
New December 2003; 24/7 "Hope Chs."
FTA (occ sport); also try 3863.Sr6.100
FTA-tyt NTSC-occ sport, live Shuttle
PowVu CA + FTA (ABC-A-P 'til 'early' 2005)
was 4148Vt; some FTA
Korean MUX, reload 02/03
Tests, late May start; also 12.646H
Testing possible data links; June 2003
SE spot beam; was 4027LHC
east spot; 10TV + r each, vertical pol.
1+ FTA, MediaGd "2"; + 10.975 weaker
Testing Fiji region pay-TV (MDS) package (Oct '04)
DMV/NTL early vers. occ feeds, typ ca
DMV/NTL early vers. occ feeds, typ ca
DTS Direct to Sailors; audio previously FTA - gone
DMV/NTL early vers. occ feeds, typically ca
east hemi 20.5 dBw +; new Sr
DMV/NTL early vers. occ feeds, typ ca
SCPC, mixed CA and FTA feeds
PowVu CA; Auckland net feeds
CA, Leitch encoded
New PIDs Dec 03 very strong NZ, Pacific
FTA SCPC; East Hemi Beam-Tahiti
24/7 live space walks, conferences - West Hemi beam
SCPC, mixed CA & FTA, feeds
NBA feeds - probably CA - new Nov 2003
PowVu CA & TBN-JCTV FTA
16-QAM (not MPEG-2 compatible)
Data only but useful for dish alignment, top Sr check
Tests - Taiwan TV temporary; data coming (NZ beam)

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. AV-COMM P/L, 61-2-9839-4377.

AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption; review SF#120. Contact # above.

AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.

Coship 3188C. Review SF#107. Blind search FTA rcvr, works well. Available from Satlink NZ www.satlinknz.co.nz. (ONLY KNOWN DISTRIBUTOR IN WORLD)

Divitone: "Left-handed" review SF#115; does "code key" entry. Available <http://www.satmax.ws>

eMTech eM-100B (FTA), eM-200B (FTA + Cb2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)

Fortec Star Lifetime. Two versions, both blind search, code-key programmable, one X 2 CI. Review SF#119. www.aDigitalLife.com

Humax ICRI 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.

Humax IRCI 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).

Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)

Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.

Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.

INNOVIA IDS3068. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix Technologies, and Satmax (<http://www.satmax.ws>).

ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.

MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. 61-2-9618-5777

MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777

MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.

Multi-choice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738

Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.

Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)

Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced; Sept 18 (2003) "drop-dead" day; all were to have been "turned off" on that date (in fact, those with V1.13 CAMs may still be working; still does radio including CA, not TV).

Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).

Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH (below): 222; terminated

Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review SF#51. SATECH 61-3-9553-3399.

Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)

PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unassisted with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).

PowTek. Blind Search Chinese sourced, field tests rate it highly. Source jason@aDigitalLife.com

Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.

SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available.)

SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.

SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.

SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator; improved version 3618. Review SF#113; available DMSi (above).

Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superseded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin

Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).

Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.

Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.

Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.

Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.

UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.

UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faulty P/S. Norsat 61-8-9451-8300.

UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel, limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.

UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.

Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ. fax 64-9-814-9447; long term teletext problems (loses TT).

"X" Digital. When modified with "aftermarket" Internet software, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990).

Accessories:

Aurora smart cards. MYCRYPT (Irdeto V2) cards now available (Oct. 2003), Sciteq 61-8-9409-6677.

PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)

PowerVu (Pacific) repair service: Cable & Sat Svcs. Darius West. 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

As of November 5th: 99% certain Fiji TV will be on C-band, 1701, circular, as detailed p. 14 here. When? "Before Christmas 2004," using temporary 'Flyaway' 6 GHz uplink. Fiji TV FTA, balance of 11 channels CA Nagravision 2; 4.055 GHz, RHC + 2nd Tr, Sr 16.500, 2/3. Auckland? 1.5m or smaller. Sydney? 2.4m. Details in SF#124 -December.

AMC-15/136W: Launched October 14 by Proton, testing at 136W but all tightly focused northern beams on Ku and Ka only; will move to 105W when functional.

AsiaSat 3S/105.5E: "All Zee 3700V and 4140V programme channels switched to SECA 2 CA mid October - save Zee International 3700V which remained SECA 1; subsequently, returned to CA while others - one at a time-briefly FTA." (Harvey, NT) "STAR TV mux 3920H (Sr 26.850, 7/8) has made changes; Sports Asia has new PIDs (V514/A670); reload if missing." (DLeach, NSW)

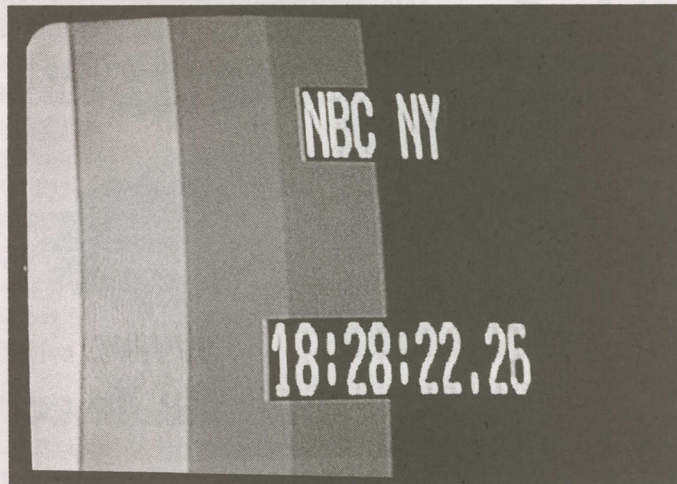
AsiaSat 4/120E: "VTV testing 12.427V, Sr 20.000, FTA and tests of Viaccess." (C. Sutton, NZ) "Signal 90% on 65cm in NSW." (DM) "Signal 30% on 65cm, NZ." (Lawrence) (Editor's note: Asian religious channel Da Ai TV moving here full-time (from B3), was testing 31 October.)

Intelsat 701/180E: "Fiji TV plans brief testing during period Nov 8-19 here (11.074H)." (Gloria, Suva) (Editor's note: See p. 14)

NSS-6/95E: "Bluekiss Ku to Australia now permanently shut down." (JK, Sydney) (Editor's note: See p. 2, here)

Optus B3/152E: "BET Nahrain on 12.525V (Sr 30.000, 2/3) is new on Globecast MUX; station is headquartered in Modesto, California and Syrian + English (Assyria). Content of English is radically pro-Bush administration." (IF, Qld.) (Editor's note: Station is actually UHF ch 23 [KBSV-TV] licensed to Ceres, Ca [a town just south of Modesto], an area of heavy Lebanese/Syrian immigration. Web site is <http://www.betnahrain.org> and they are looking for installers but be wary - this is a 'test' and they may disappear; contact kbsv@aol.com.) "12.525V channel labelled 'ETV' has been 'NOW TV' from As3S." (IF, Qld.) (Editor's note: Went CA Mcrypt 3 Nov.) "T10/12.3784H, Sr 5.851, 2/3 is not MPEG-2 but there is something here!" (PaulL, NSW) "Horse Channel, 12.563H, Sr 30.000, 2/3 appears to have shut down October 10." (NS, Victoria) "12.657V Globecast (30.000, 2/3) TRT test card only from 5 November 5." (IF, Qld)

Optus C1/156E: "Late in October T1lower is again running 12.286V, Sr 28.642, 1/2 and T1upper is 12.342V, Sr 24.450, 1/2; no NIT or PAT (channel loading tables)." (IF, Qld.) (Editor's note: On Oct 18, Optus had 10 TV, 19 radio services loaded on 12.324V, mostly ABC regionals; 5 Nov Optus removed CA from 12.324V. Possibly 12.324V T1/upper will be ABC mux from Belrose while T1/lower 12.286V will uplink from Lockridge.) "12.407V (Aurora), Sr



When major USA news breaks, the satellites go "hot" with live feeds from networks such as NBC and CBS. Where to find? 1701, 3769RHC, Sr 20.000, 7/8 and PAS-2 3901H, Sr30.800, 3/4.

30.000, 2/3 on 21 and 25 October replaced usual 'Optus BOC' testcard with new test card labelled 'WOBX QNSLAND' on BTv1, using different PID numbers (CA of course)." (George, Victoria) "On Oct 27 Optus added Aurora radio channel 28, Aboriginal, 'ARDS', audio PID 1072. EPG declared, 'Now broadcasting test transmission.'" (Larry L, NSW) "This is strange: 12.407V, on Aust + NZ footprint, Central 7 'testing' (?) (Sr 30.000, 2/3) on channel 7; VPID 1280, APID 1281, PCR 1280, text 1282. Simultaneously same Tr, channel 9 - SBS TV (SE) V528, A529, PCR518, text 531. And on Aurora channel 27, SBS (different time zone from preceding) V544, A545, PCR518, text 547. Normal Aurora cards may not play these (Editor's note: see update, p. 2)." (JKing, NSW) "T18/12.598H, Sr 27.800, 3/4 has added MTVp which based upon EPG would seem to be comedy programmes." (JV, NSW)

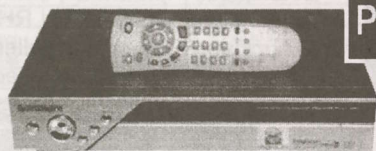
Palapa C2M/113E: "Back again - Satelindo MUX 4080H, Sr 28.125, 3/4, includes MTV." (DSW, Australia) "3580H, Sr 27.500, 3/4, switches in and out of CA and FTA with 12 channels loading as Kabelvision; MUX 4000H is now off. Also, SCTV 4048V is gone, replaced with 3726V, Sr 6.620, 3/4." (D. Leach, NSW)

PanAmSat PAS2/169E: "Occ feeds 3813V, Sr 6.620, 3/4." (B.Richards, SA)

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady.

Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for December 15th issue: December 3 by mail or 5PM NZST December 5th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

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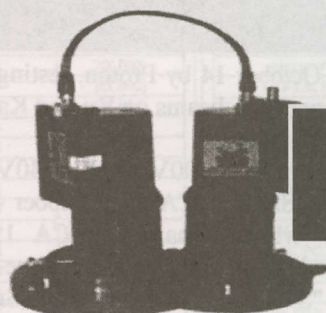
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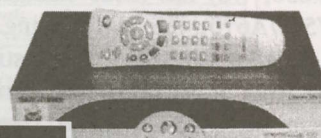


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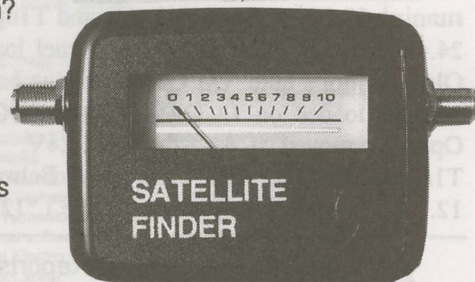
DMS International

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Fiji Islands

C.B. Communications, **Sigatoka** (Ph6520227; cbcom@connect.com.fj)

Safeway Electronics Ltd, **Suva + Lautoka + all islands** (Ph 3395300/6666822; safeway@connect.com.fj)

SATSHEK Communications, **Suva** (Ph3307933; parmarbros@connect.com.fj)

New Zealand:

Tauranga TV Svcs Ltd, western **Bay of Plenty** (ethnic Ku packages) (Ph 07 578 7276; dave-tts@clear.net.nz)

Raycom, **Coromandel Peninsula/Waihi/Tairua** (B1 FTA) (Ph 07 864 8083; raycom@slingshot.co.nz)

Frontline Electronics, **Mosgiel** region (ethnic Ku packages) (Ph 03 489 4001)

Advanced Aerials, **Napier/Hawkes Bay**, comcls (Ph06835 6618/021 272 6618; advanceaerials@xtra.co.nz)

Nelson TV & Video Svcs, all **Nelson Bays** (Ph 03 548 0304; ntv@tasman.net)

Rexels AV Electronics Ltd, **Palmerston N, Manawatu, Hawke's Bay, Wanganui** (Ph 06 357 6186;

rblair@infogen.net.nz)

John Stewart, **southland** including Otago (john.s@tritec.co.nz)

The Antenna Man, **Taranaki** (Ph 06 758 1633; antenna.man@xtra.co.nz)

Quality Pics, entire **Waikaito** region (Ph 0800 007 667; maxnkay@xtra.co.nz)

Smartzone, **Wellington-Wairarapa-Palmerston N** (C+Ku) (Ph 029 289 6333; info@smartzonesystems.co.nz)

Homestead HiTech, **Wellington, Masteron-Levin** (PAS-2, B1, B3) fitzgera@ihug.co.nz)

Waipu Cable Television, **Wellsford to North Cape** (*Bluekiss*), (Ph 09 4320 973; waipucable@xtra.co.nz) (*)

New South Wales:

Woolgoola Antenna Service, **Coffs Harbour** (50km radius) (Ph 0266561889; woopaerials@iprimus.com.au)

Town & Country Antennas, 60km radius **Murwillumbra/Tweeds Heads** (Ph 02 6672 8595)

Newcastle Satellite, **Newcastle + Lwr Hunter Vly** (Ph 0249614449; satellites@netcentral.com.au)

Home Satellite TV, 40km radius **Port Macquarie** (Ph 02 6584 3838; kazbah25@optusnet.com.au)

Goodcom Communications P/L, 100km radius of **Walcha** (Ph 02 6777 1044; goodcom@northnet.com.au)

Queensland:

Cape York Electronics, **Cooktown and "the cape"** (started 1970s) (Ph 07 40 695 252; cyectn@tpg.com.au)

Phil's Antenna Systems, 100km radius of **Hervey Bay** (C+Ku since 1996). (Ph 0741 256 273)

Rick Dalton TV & Satellite, 100km of **Kawana Waters** (C + Ku). (Ph 07 5493 4343; rick@antechtv.com.au)

Teleworks, 100km **Cairns** (C + Ku). (Ph 0412 84115; rajvrm@aol.com) (*)

South Australia

Central Eyre Comms, **Arno Bay-Eyre Penins.** (Ph 08 8628 0203; centraleyrecomms@ozemail.com.au)

Tasmania:

.65 Electronics, **Launceston and Northern Tasmania** (Ph 03 63 330820; sales@65group.com)

Victoria:

Riviera Satellite Antenna Svcs, 100km radius **Bairnsdale** (Ph 03 5152 4884; gilhooleystv@net-tech.com.au)

Leden Communications, (100km radius) **Glengarry** (Ph 0427 745105; leden@netspace.net.au)

Geoff's Communications, 60km radius **Korumburra** (Ph 0408 582010; gwyhoon@tpg.com.au)

Foreign Satellite TVP/L, **Melbourne (region)** C+Ku since 1995 (Ph 040445509; joe12@dodo.com.au)

Solomon Islands

Satellite Solutions, **Honiara + all Solomon Islands** (since 1994) (Ph 677 25589; satsol@solomon.com.sb)

Thailand:

JSAT tv/Jon Clarke, **ex-pat community - nationwide** (Ph +661 513 5418; info@jsat.tv)

To be listed here, tell us: 1/name of your business or your name, 2/ your home town and radius-distance covered from same, 3/ your telco, 4/ your e-mail. Send to skyking@clear.net.nz, or fax to ++64 9 406 1083 or mail to SatFACTS, PO Box 330, Mangonui, Far North, NZ. No, there is no charge to be listed but you must be a SatFACTS subscriber! (* - NEW or modified this month.)

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PanAmSat PAS8/166E: "Golf Channel (UK) FTA, then PowerVu 3940Hz, Sr 27.690, 7/8." (KN) "12.575H, Sr 13.845, 2/3 GDTV, Sa-Ai and TFC FTA mid-October." (BRichards, SA)

Soapbox: "MTV Networks has changed from Singapore Telecom to Ascent Media facility. MTV was shut down for up to 30 minutes Oct. 26 for Palapa C2, Oct. 28 for PAS8 and Oct 30 for PAS10. Contact is in Singapore at ++65-420-8912." (G. Welsby, PNG) "New FTA service on Globecast B3 called AMTV - described as a 'mini-SBS'. Web site is www.amtv.com.au." (P. Burton, NZ) "I do not believe UNwired should be so quickly accepted as a permanent resident of C-band. I see UNwired as being an example of

overly rich, spoilt bastards not caring about whom they hurt - it is all about making (more) money. I expect several hardware firms will take advantage of our present situation in Australia and charge extravagant prices for the technology to solve the problems UNwired is creating. I wonder how long it will be before 3.7>4.2 LNBs become rare and expensive!" (AI, NSW) "I believe that most of the pay-TV transponders are actually carrying 3 separate encryption systems: NDS, MCRYPT and Irdeto V1 (T2 and T5 however are exclusively NDS). On October 20th, at 1:45AM I found momentary decoding with a Nokia and gold card on a 12.638H channel - suggesting I may have caught them doing a masterkey change." (NS, Victoria) "Sky Tower Auckland terrestrial broadcasting 'ARTS Channel' 12.068H, Sr 10.421, VPID 0512, APID 0650, PCR 8190, FTA." (C. Sutton, NZ) (Editor's note: Perhaps a link from ARTS production centre to SKY for satellite feeds.) "I found the DMS International advertisement that included 3.4 GHz dipoles very unnerving; UNwired are, as Scratchi wrote in SF#122, 'spectrum terrorists' and anyone who supports them in any way has no business being in a satellite magazine!" (NS, Victoria) "The 'Tiny-Tot' receiver from Av-Comm really need to be able to run on 9V to 16V or 11V to 13.9V as an absolute minimum to cover the range of lead-acid battery voltages it is likely to experience." (IF, Qld.) "Useful patch site is <http://www.geocities.com/funtechpatch2004/>." (Billy T.) "Some folks having trouble loading NASA-TV's low symbol rate (2.000) may have a receiver deficiency - such as Hyundai?" (IF, Qld.) "OzEmail also offering 'metrowide' wireless at \$49.95 monthly; 'no phone lines'." (IF, Qld.) "Well placed? On Sunday Oct 17 UBI channels through Globecast began to pixelate; some channels had 'Topfield' (brand) fault announcements displayed ('E200 lose signal'). On 19th UBI replaced pixellating channels with on screen announcement, 'UBI-experiencing technical difficulties-interference with our signal'. Would this have been UNwired at work???" (AR, Sydney) (Editor's note: So why should UBI be UNwired-exempt?)

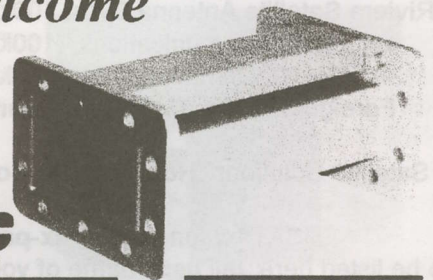
UBI and Globecast Loading Sequences

As of Nov 1 Globecast uses Network ID 0001 on both 12.525V and 12.657V (B3). Meanwhile UBI made the NID the same as the TS IDs; 12.674H (lower) loads first (NID 0001, TSID 0001), then 12.701H (N/T 0002), followed by 12.613H (N/T 0003) and finally 12.649 (N/T 0004). This causes confusion for receivers loading B3 - intermixing UBI's 12.674 and the two Globecast (as they share NIT numbers). As of this date, UBI's channels (still FTA but "at least Turkish channels" promised to become CA Nov 12) load as: (1) ESC/Arabic, (3) Al Mehwer/Arabic, (4) Nile Drama/Arabic, (5) Nile Variety/Arabic, (6) (test card) (7) Kurdistan, (8) Heya TV/Arabic, (9) New TV/Arabic, (10) Syria TV/Arabic, (11) Al Majd/Arabic, (12) Najoom/Arabic, (13) Al Arabiya/ Arabic, (14) Infinity/Arabic, (15) MBC/Arabic, (16) Mazzika/Arabic, (20) Info-Channel/English, (21) STV/Turkish, (22) TRT Int/Turkish, (23) ATV/Turkish, (24) Kanal D/Turkish, (25) Kanal 7/Turkish, (26) Show TV/Turkish, (27) NTV/Turkish, (28) Liq TV/Turkish, (29) Mad TV/Greek, (30) Holidays in Greece, (33) MKTV/Macedonian, (34) RTV BN/Serbian, (36) BKTv/Serbian, (37) Pink Plus/Serbian, (38) TVE/Spanish, (39) TV Chile/Spanish. Note as of this date channels 2, 7, 17-19, 30-32, and 35 have no programming and a few more above 39 (40+) could also be added. UBI contact is 1300-400-800, 9AM-6PM AEST Monday-Friday. UBI also has 52 radio channels allocated; mostly not in use yet.

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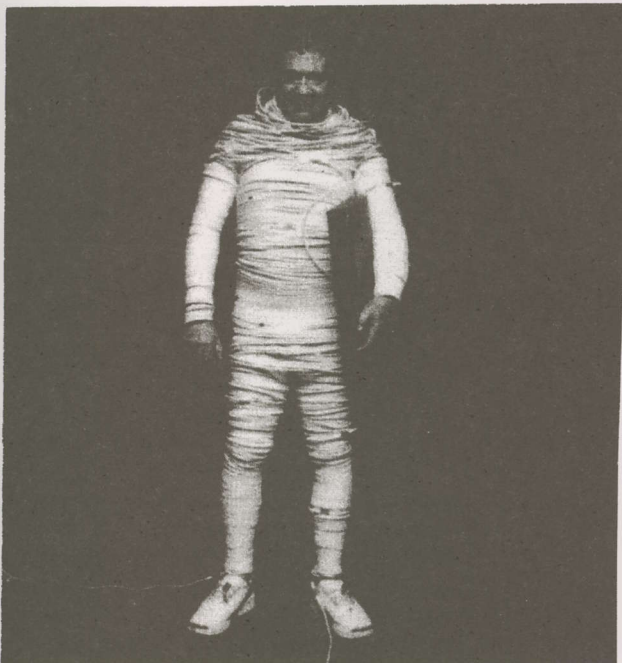
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Good Things - that started in SatFACTS

SatFACTS for October, 2003 reported on a new "Television via Internet" initiative created by a fellow in New York (City). TV2Me is a (patents pending) bit of software and matching hardware that allows someone (you, for example) to have your at-home "local TV" follow you to virtually anyplace on the globe. At home a special encoder interrogates your DTH or cable STB, and transfers the channel you select to broadband Internet. You make the channel selection from anyplace on earth with a PC connection to your "home" because TV2Me is a two-way system.

We followed up this report in SF November (2003) and SF January (2004). In the past 12 months, TV2Me has grown into a mature, if still high-priced, serious contender for "your entertainment dollars." Folks like Musician Sting, UN delegates from Argentina, heads of state, now routinely "take hometown TV" with them when they travel. There has been very little publicity about TV2Me - save in SatFACTS and that has happened only because the inventor of the system, Kenny Schaffer, is both a friend and a TV2Me confidant from before it was a working system.

The December or January issue of WIRED magazine will feature Schaffer's "invention" in a major public unveiling. In late October, WIRED sent a professional front-cover production crew to Schaffer's New York penthouse apartment where they wrapped him in over 1km of coaxial cable (! - remember - "WIRED") for the photo shown here (a "proof-polaroid" taken during 25 shots).



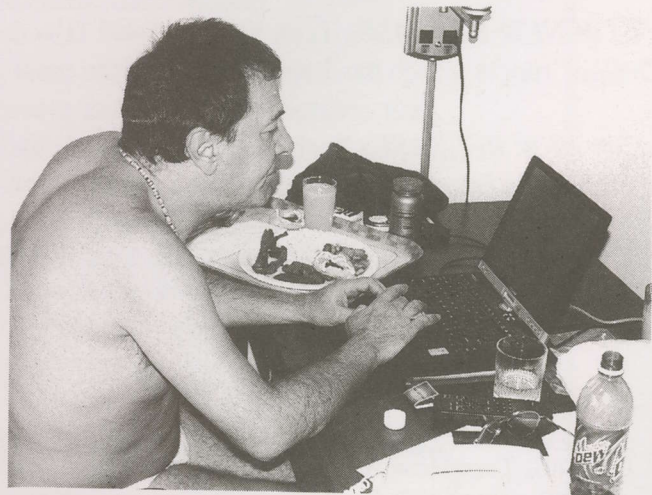
Schaffer (painfully) wrapped in over 1km of coaxial cable (we think it is RG59 - for shame!) for either front cover or inside feature article in WIRED - December or January - at a news-stand near you.

TV2Me has taken 12+ months to go from interesting technology shared with fewer than a dozen folks world-wide to a serious contender for discretionary spending by devoted fans of television. Noted columnist Robert X. Cringely (<http://www.pbs.org/cringely>) devoted his October 28 (2004) report to TV2Me as well.

Last November (2003) Kenny and SF publisher Coop travelled to Denver, Colorado to visit with Charlie Ergen, founder and CEO of (The) DISH Network. Charlie, Coop and yes Kenny go back to the stellar C-band days in America of the early 1980s and when Coop thought TV2Me was ready for its first public demonstration, he arranged for Ergen and his DISH president Mike Dugan to spend a day becoming

familiar with the system. Two TV screens, set up in a DISH walnut panelled board room, simultaneously displayed the viewer's selected channel from Shaffer's New York City apartment (more than 200 Time Warner cable channels) and Shaffer's Moscow base station (66+ channels). Ergen was so impressed ("Wow! This is the big one!!!") that the scheduled two hour meeting extended to four. Alas, TV2Me did not fit into the DISH plans so Schaffer returned to the street to find a backer.

For 30 hours prior to meeting with Ergen, Coop and Schaffer crammed into a Denver Marriott Hotel room connected to a 350 kbps (claimed) "broadband" line as Schaffer's incredible PC skills directed minor modifications of the TV2Me web site in New York. WIRED may have him wrapped in coaxial cable - we have Kenny "in the raw" pounding away to New York and Moscow on "the web" framed between an uneaten Marriott breakfast we went to the lobby to bring to him and a bottle of his favourite American soft drink.



Schaffer (amateur N2KS), "in the raw," in Denver. Sting would have been proud of him; Alice Cooper too!

Alas, my favourite photo (of several dozen taken during our "Denver visit to DISH") follows. Bob Luly invented the fold-up parabolic "umbrella" dish which NASA eventually made their own, as well as the magnetic polariser. Schaffer invented the original rock star "wireless microphone," Russian Molniya TV, and Alice Cooper. Charlie Ergen invented getting rich in satellite TV and then there's humble me.



Luly, Schaffer, Ergen and Coop.

I'll save the "strangest" for another time - Schaffer's Russian borne TV actress wife sitting on the lap of Rupert Murdoch. Now that's a story! (Bob Cooper)

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Perhaps you missed something important? It is still available!

Hard Core (seriously SERIOUS!) "How to do it" References

- ☐ **UHF 20' Parabolic:** For a few hundred dollars in materials at the local lumber yard, you can build a 20+ dB gain UHF parabolic capable of providing "scatter region" reception to 300km! \$15 all regions.
ARCHIVAL LONG LOST AND NOW FOUND!
- ☐ (■ **NEW RELEASE**) Tech Bulletin 9403 (t) - the legendary 40 page "VHF/UHF Receiving Antenna Design" report which has been said to be "the most perfect description of how VHF-UHF antennas work" ever created. This has never previously been offered - \$15 all regions.
- ☐ (■ **NEW RELEASE**) Tech Bulletin 9401 - Actually follows in sequence TB 9305 Cable TV (below) - this issue (also long lost - not previously offered!) takes you through the hands on detail of actually planning a cable TV system - \$15 all regions.
- ☐ Tech Bulletin 9402: **MATV** (master antenna terrestrial) systems - wiring up a home, motel, hotel, camp grounds from one set of antennas - \$15 all regions.
- ☐ Tech Bulletin 9404: **Home Satellite Dish Systems.** "Newbie" trying to work out what all of those funny terms mean and how a home system goes together? Perfect. \$15 all regions.
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- ☐ TB9301: **Terrestrial Antenna Systems** to eliminate co-channel interference, stack for additional gain. \$15 all regions.
- ☐ TB9302: (Terrestrial) **Weak Signal Techniques;** off air reception to 300km+ using conventionally available equipment. Seriously detailed. \$15 all regions.
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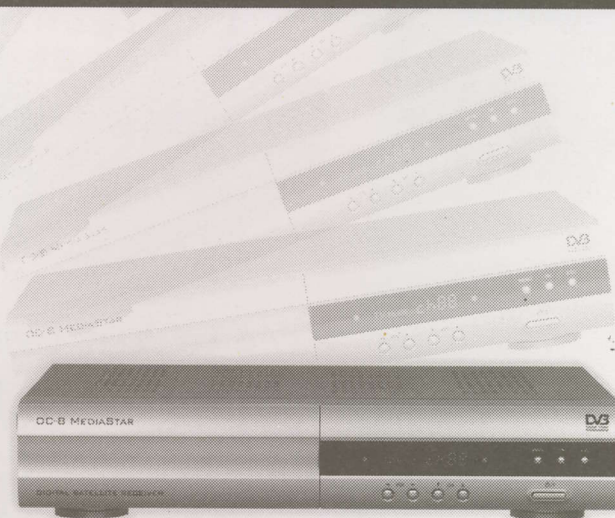
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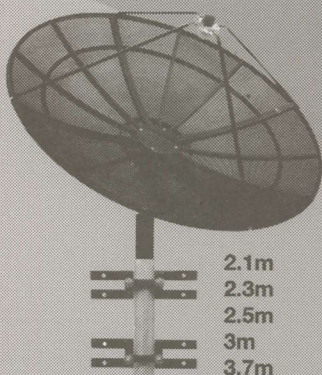
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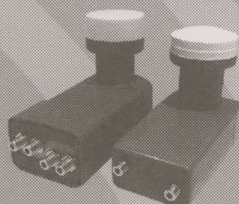


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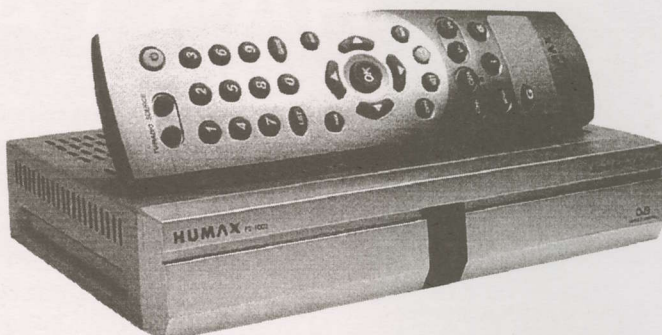
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